

NAVSHIPS 900,719



RESTRICTED

INSTRUCTION BOOK

for

NAVY MODEL

MAR

RADIO TRANSMITTING AND
RECEIVING EQUIPMENT



RCA VICTOR DIVISION

of

RADIO CORPORATION OF AMERICA

Camden, New Jersey, U. S. A.

NAVY DEPARTMENT



BUREAU OF SHIPS

NAVY 100,710

INSTRUC

INSTRUCTION BOOK

for

NAVY MODEL

MAR

APPLICABLE TO THE MARINE AND
NAVY EQUIPMENT

Immediately preceding Section VIII is a lubrication
chart for the selector mechanism.

NAVY VICTOR DIVISION

RADIO CORPORATION OF AMERICA

NAVY DEPARTMENT

NAVY DEPARTMENT

BUREAU OF SHIPS

Control No. 10008

Approved 15 May 1943

immediately following the completion of the

of the following information:

NAVSHIPS 900,719



RESTRICTED

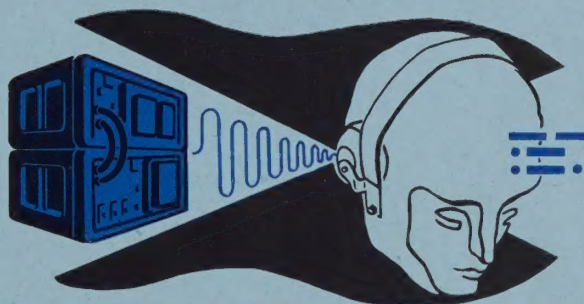
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Camden, New Jersey, U. S. A.

NAVY DEPARTMENT

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1B-38370

Contract NXsr 60008 ★ Approved 15 May 1945

NAVY DEPARTMENT

BUREAU OF SHIPS

WASHINGTON 25, D. C.

15 May 1945

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Extracts from this publication may be made to facilitate the preparation of other Navy instruction books and handbooks.

Copies of this publication should be obtained from the nearest Radio Material Officer.

(s) J. B. DOW
By direction

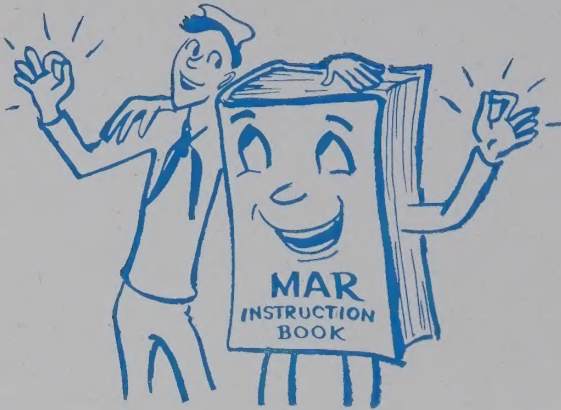
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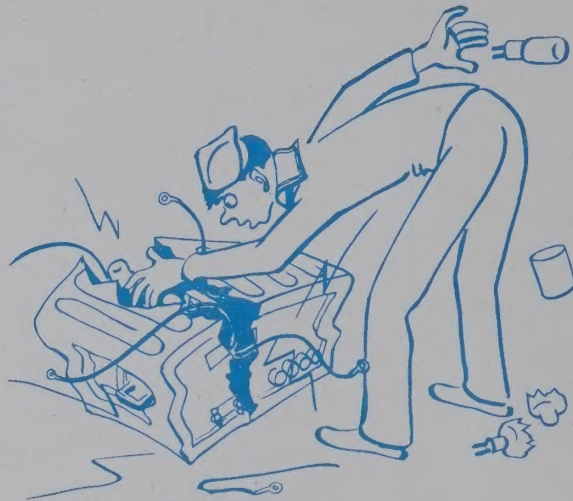
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Do Not

USE YOUR MAR
INSTRUCTION BOOK
AS A LAST RESORT

***Use It
FIRST******Do Not***

LET A MINOR REPAIR
BECOME A MAJOR
OVERHAUL . . .

***FOLLOW***

MAINTENANCE
INSTRUCTIONS
IN EVERY DETAIL

Do Not

OVERLOOK WARNINGS,
CAUTIONS, AND NOTES.

THEY KEEP YOU
OUT OF TROUBLE

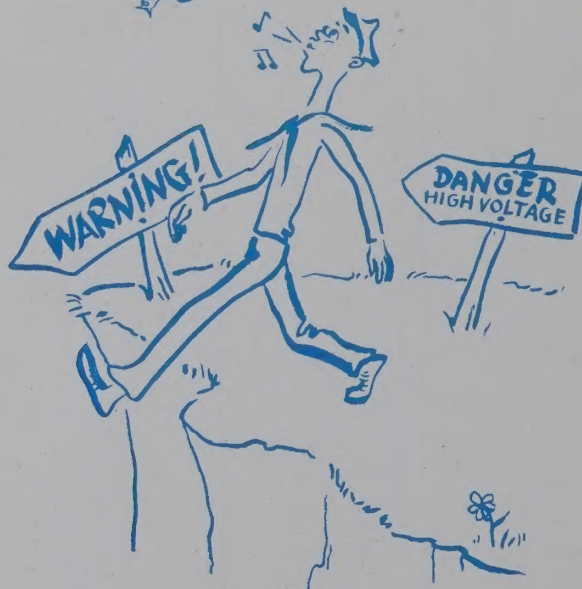


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GUARANTEE

The Contractor guarantees that at the time of delivery thereof the articles provided for under this contract will be free from any defects in material or workmanship and will conform to the requirements of this contract. Except as to vacuum tubes, batteries, rubber and material normally consumed in operation, the equipment, including all spare parts, is guaranteed for a period of one (1) year from the date of its delivery to and acceptance by the Government, with the understanding that all items found to be defective as to material, workmanship or manufacture will be repaired or replaced, f.o.b. any point within the continental limits of the United States designated by the Government, without delay and at no expense to the Government; provided, that such guarantee shall not obligate the Contractor to repair or replace any such defective items unless the defect appears within the aforementioned period and the Contractor is notified thereof in writing within a reasonable time and unless the defect is not the result of normal expected shelf life deterioration. This guarantee shall then continue as to corrected or replacing articles or, if only parts of such articles are corrected or replaced, to such corrected or replacing parts, until one year after the date of redelivery.

To the extent the equipment, including all parts and spare parts, as defined above, is of the Contractor's design or is of a design selected by the Contractor, it is also guaranteed, subject to the foregoing conditions, against defects in design, with the understanding that if ten per cent (10%) or more of the total quantity comprising such item furnished under the contract (but not less than two thereof) is found to be defective as to design, the entire item will be conclusively presumed to be of defective design and shall be subject to one hundred per cent (100%) correction or replacement by a suitably redesigned item.

All defective items will be subject to ultimate return to the Contractor except that the exigencies of the naval service may necessitate expeditious repair of certain items in order to prevent extended interruption of communications and in such cases the return of the defective items for examination by the Contractor prior to repair or replacement shall not be mandatory. The report of a responsible authority, including details of the conditions surrounding the failure, will be acceptable as a basis for effecting expeditious adjustment under the provisions of this contractual guarantee.

INSTALLATION RECORDS

Contract No. NXsr 60008

Dated 4 May 1944

Serial Number of equipment.....

Date of acceptance by the Navy.....

Date of delivery to contract destination.....

Date of completion of installation.....

Date placed in service.....

Blank spaces in this book shall be filled in at the time of installation. Operating personnel shall also mark the "date placed in service" on the date plate located below the model nameplate on the equipment, using suitable methods and care to avoid damaging the equipment.

FAILURE REPORTS

NBS 203A NAVSHIPS (200)
NAVY DEPARTMENT
 BUREAU OF SHIPS
 WASHINGTON, D. C.
 OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID
 PAYMENT OF POSTAGE \$300

NAVY DEPARTMENT

BUREAU OF SHIPS
 RADIO DIVISION, CODE 970
 WASHINGTON 25, D. C.

FAILURE REPORT
 NAVSHIPS (NBS) 383
 REVISED 5-44

NOTICE—Read notes on reverse side. Additional forms or envelopes may be obtained from nearest RMO.

DATE 7 OCT., 44

SHIP NUMBER AND NAME OR STATION USING EQUIPMENT WHEN FAILURE OCCURRED
 USS ATTU (CVE 102)

NAME AND RANK OR RATING OF PERSON MAKING REPORT (PROBABLY REPAIRMAN)
 A. L. ABBOTT, RAD. ELECT.

EQUIPMENT INVOLVED
☒ RADIO ☐ RADAR ☐ SONAR ☐ OTHER

MODEL NO. TBS-5

NAME OF CONTRACTOR
 RCA

SERIAL NO. (CONSULT NAMEPLATE)
 264

TYPE NUMBER AND NAME OF MAJOR UNIT INVOLVED
 CRV-46068A RADIO RECEIVER

SERIAL NO. (CONSULT NAMEPLATE)
 308

CONTRACT NO. (CONSULT NAMEPLATE)
 NXSS 18747

DATE INSTALLED (IF KNOWN)
 6/30/44

GIVE BRIEF DESCRIPTION OF PART ITEM OR PART WHICH FAILED
 RESISTOR, LOW PWR, MOLDED, PHENOLIC, WIRE WOUND 100 OHMS, R-432

NAVY TYPE IF AVAILABLE
 63678-1C

APPROXIMATE LIFE
 3 MONTHS

BRIEF DESCRIPTION OF FAILURE (USE OTHER SIDE OR SEPARATE SHEET IF ADDITIONAL SPACE IS NECESSARY)
 PARTIAL OPEN, INCREASED RES. TO 18000 OHMS (OVER)

18-3832-5

INSERT IN ENVELOPE—SEAL—MAIL

RECEIVER DEAD; SUBSEQUENT TESTS SHOWED R 432 TO READ 18000 OHMS INSTEAD OF 100 OHMS. THIS MAY HAVE BEEN DUE TO OVERHEATING, BUT SUSPECT A DEFECTIVE RESISTOR. THIS INCREASED RESISTANCE CAUSED THE FINAL STAGE TO BE BIASED BEYOND CUT-OFF, RESULTING IN A DEAD RECEIVER. REPLACED FROM STOCK; RECEIVER THEN NORMAL

This new simplified failure report form has been prepared to make the submission of these reports quicker and easier. Franked envelope (Form "NAVSHIPS" (NBS) 383A) is supplied for your convenience in submitting and form—if not available mail to BUSHIPS, Attn: Code (970).
 Purpose of this report is to inform BUSHIPS of the cause and rate of failures.
 Report MUST be filled out and forwarded for EVERY DERANGEMENT of equipment (last tubes) whether by DEFECTIVE PARTS, WORN PARTS, IMPROPER OPERATION, or EXTERNAL INFLUENCES.
 Report is not a requisition. You must request the replacement part from your Tender, Supply Officer, or Material Officer.
 Report may be filled out with TYPEWRITER, PEN, or PENCIL.
 Confidential information is included in description of failure, mail in accordance with NAVY REGS. Form "NAVSHIPS" (NBS) 383 supersedes the old septuplicate form. No copies are required.
 Instructions pertaining to preparation and submission of the old form (including sect. VII, part 2, of SHIPS' Manual, not yet distributed, April 1944) are hereby canceled. Adjustments of contract will be made between BUSHIPS, INSMATS, and CONTRACTORS.

18-3832-5 D. & SUPERSEDES PREVIOUS EDITION

A FAILURE REPORT must be filled out for the failure of any part of the equipment (except tubes) whether caused by defective or worn parts, improper operation, or external influences. It should be made on Failure Report, form NBS-383, which has been designed to simplify this requirement. The card must be filled out and forwarded to BUSHIPS in the franked envelope which is provided. Full instructions are to be found on each card.

Use great care in filling the card out to make certain it carries adequate information. For example, under "Circuit Symbol" use the proper circuit identification taken from the schematic drawings, such as T-803, in the case of a transformer, or R-207, for a resistor. Do not substitute brevity for clarity. Use the back of the card to completely describe the cause of failure and attach an extra piece of paper if necessary.

The purpose of this report is to inform BUSHIPS of the cause and rate of failures. The information is used by the Bureau in the design of future equipment and in the maintenance of adequate supplies to keep the present equipment going. The cards you send in, together with those from hundreds of other ships, furnish a store of information permitting the Bureau to keep in touch with the performance of the equipment of your ship and all other ships of the Navy.

This report is not a requisition. You must request the replacement of parts through your Officer-in-Charge in the usual manner.

Make certain you have a supply of Failure Report cards and envelopes on board. They may be obtained from any RMO.

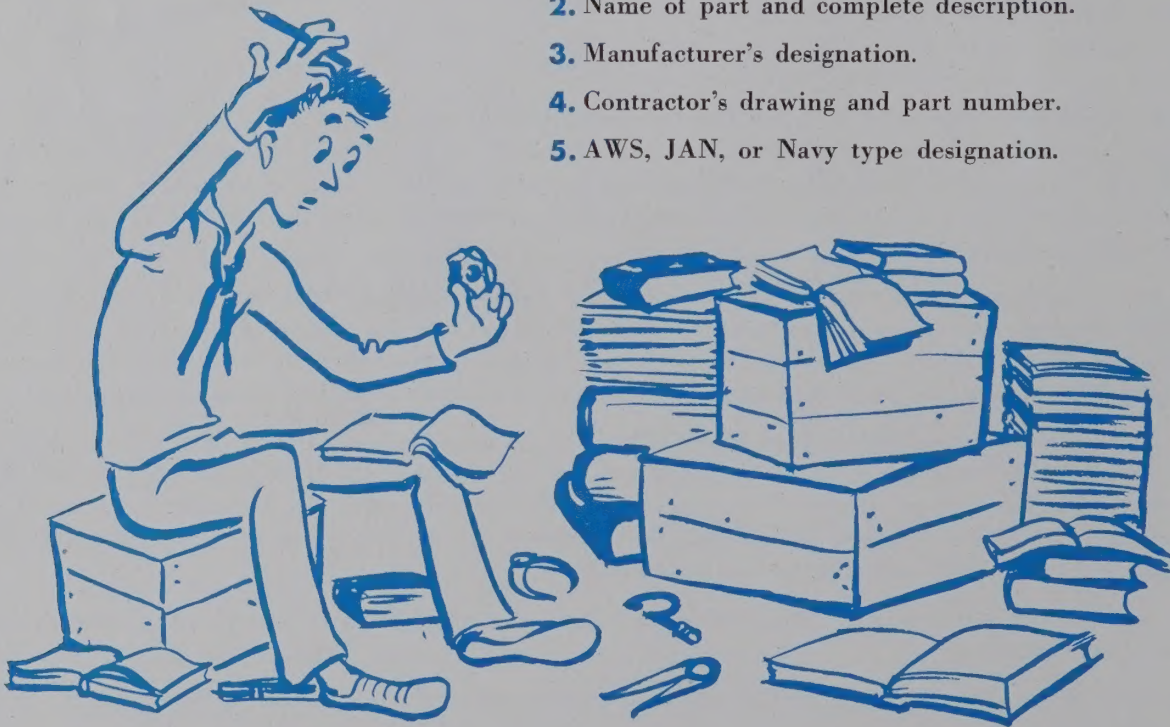
ORDERING PARTS

All requests or requisitions for replacement material should include the following data:

1. Navy stock number or, when ordering from an Army supply depot, the Army stock number.
2. Name of part.

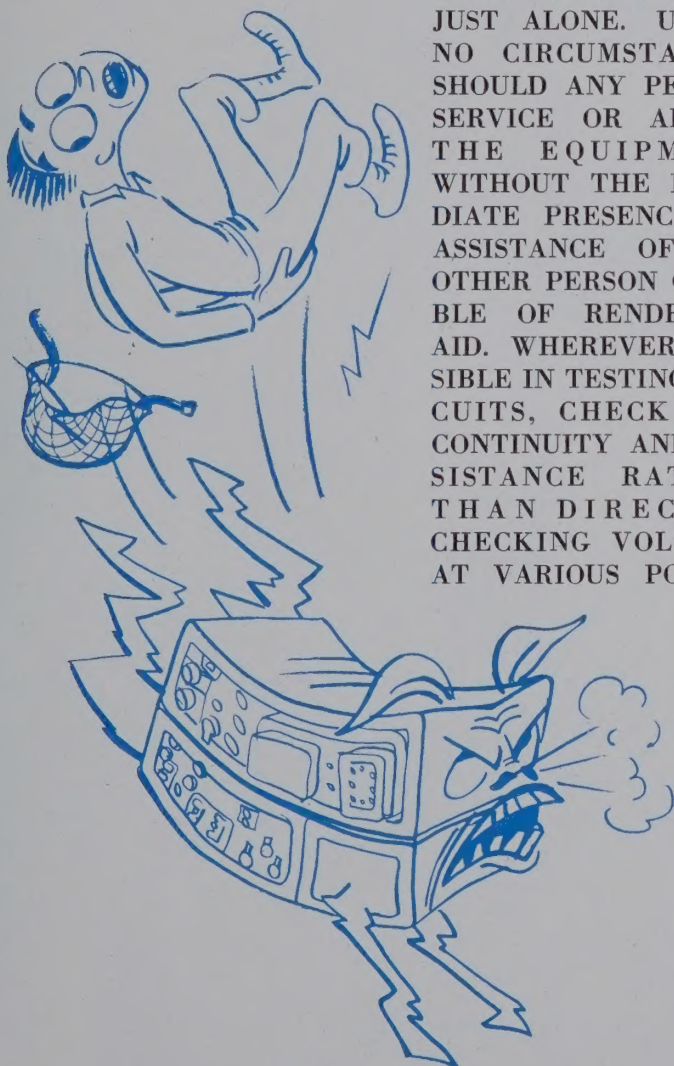
If the Navy stock number has not been assigned, the requisitions should specify the following:

1. Equipment model designation.
2. Name of part and complete description.
3. Manufacturer's designation.
4. Contractor's drawing and part number.
5. AWS, JAN, or Navy type designation.

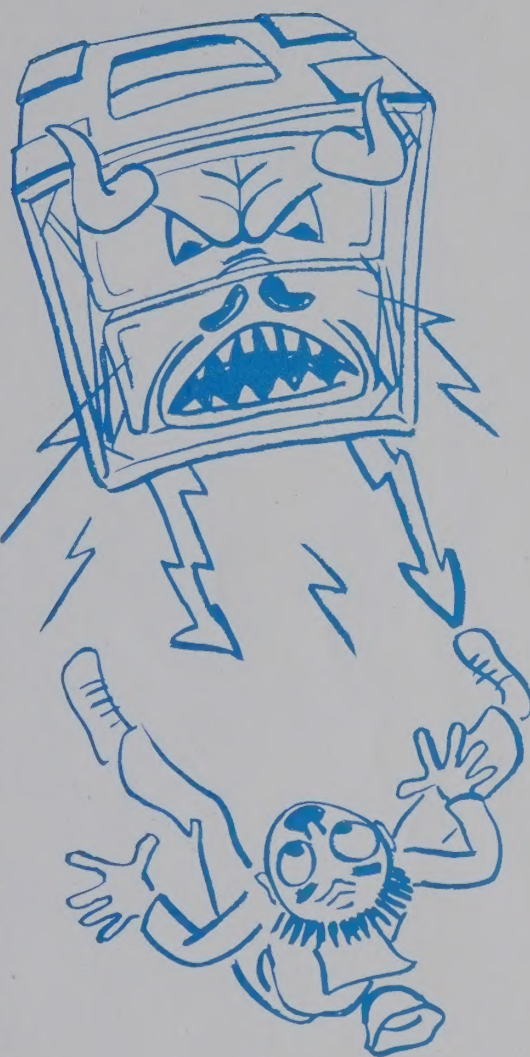


SAFETY

THIS EQUIPMENT EMPLOYS VOLTAGES WHICH ARE DANGEROUS AND MAY BE FATAL IF CONTACTED BY OPERATING PERSONNEL. EXTREME CAUTION SHOULD BE EXERCISED WHEN WORKING WITH THE EQUIPMENT. DO NOT CHANGE TUBES OR MAKE ADJUSTMENTS INSIDE THE EQUIPMENT WITH HIGH VOLTAGE SUPPLY ON. DO NOT DEPEND UPON SWITCHES FOR PROTECTION BUT ALWAYS SHUT OFF POWER SUPPLY. UNDER CERTAIN CONDITIONS, DANGEROUS POTENTIALS MAY EXIST IN THE CIRCUITS WITH POWER CONTROLS IN THE OFF POSITION DUE TO CHARGES RETAINED BY CAPACITORS, ETC. TO AVOID CASUALTIES ALWAYS REMOVE POWER DISCHARGE AND GROUND CIRCUITS PRIOR TO TOUCHING THEM.



DON'T SERVICE OR ADJUST ALONE. UNDER NO CIRCUMSTANCES SHOULD ANY PERSON SERVICE OR ADJUST THE EQUIPMENT WITHOUT THE IMMEDIATE PRESENCE OR ASSISTANCE OF ANOTHER PERSON CAPABLE OF RENDERING AID. WHEREVER FEASIBLE IN TESTING CIRCUITS, CHECK FOR CONTINUITY AND RESISTANCE RATHER THAN DIRECTLY CHECKING VOLTAGE AT VARIOUS POINTS.



THE ATTENTION OF OFFICERS, AND OPERATING PERSONNEL IS DIRECTED TO CHAPTER 67 OF BUREAU OF SHIPS OR SUPERSEDING INSTRUCTIONS ON THE SUBJECT OF "RADIO PRECAUTIONS TO BE OBSERVED."

AN APPROVED POSTER ILLUSTRATING THE RULES FOR RESUSCITATION BY THE PRONE PRESSURE METHOD SHALL BE PROMINENTLY DISPLAYED IN EACH RADIO, RADAR OR SONAR ENCLOSURE. POSTERS MAY BE OBTAINED UPON REQUEST TO THE BUREAU OF MEDICINE AND SURGERY.

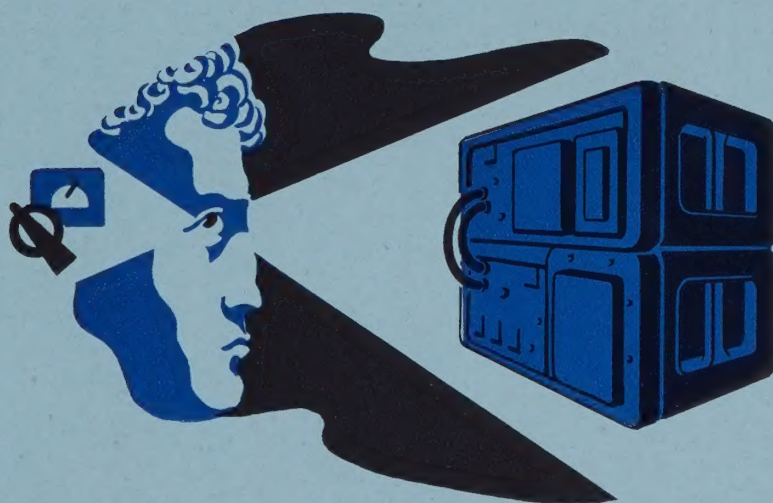
NAVSHIPS 900,719



RESTRICTED

GENERAL DESCRIPTION

SECTION 1



M—A—R

RADIO TRANSMITTING AND
RECEIVING EQUIPMENT

RESTRICTED

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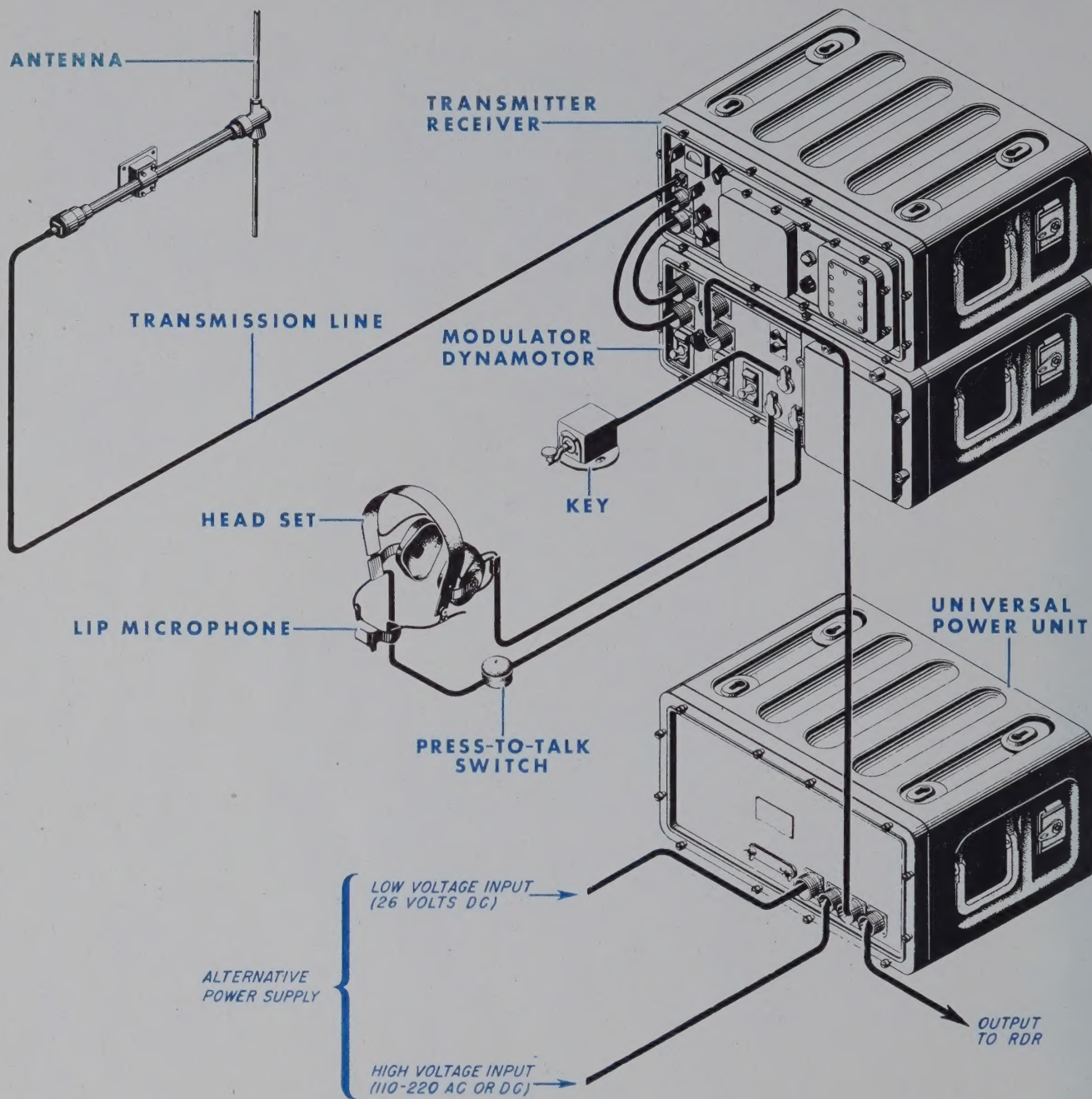
NAVY MODEL

MAR

RADIO TRANSMITTING AND
RECEIVING EQUIPMENT

The MAR Radio Communication System has been developed as a general purpose transmitter and receiver, adaptable, by means of adaptation kits, to a wide range of operating conditions and power supply characteristics. The equipment operates on ten pre-set frequencies within the 225 to 390 megacycle band and provides both phone and MCW communication as desired. Rapid change of operating frequency is possible, requiring only the rotation of a channel selector switch on the panel of the transmitter unit, and both transmitter and receiver are tuned automatically to the selected frequency channel by a motor driven mechanism.

Remote operation of the equipment is provided, utilizing for the purpose a remote control box that is connected to the radio equipment by a twisted pair of standard telephone wires or flexible cord. Both phone and keyed MCW communication may be carried on from the remote control box with distances up to a mile separating the control box and radio equipment. Selection of channel frequency is not possible from the remote control box but communication with an operator at the radio equipment can be carried on without radio emission resulting. All components of the equipment are splashproof during operation.



BASIC UNITS

QUAN.	NAVY TYPE NO.	UNIT	WIDTH INCHES	DEPTH INCHES	HEIGHT INCHES	WEIGHT POUNDS
1	CRV-43067	Transmitter-Receiver	21 $\frac{1}{4}$	14 $\frac{3}{8}$	9	45
1	CRV-50248	Modulator-Dynamotor	21 $\frac{1}{4}$	14 $\frac{3}{8}$	9	45
1	CLG-20379	Universal Power Supply	21	15 $\frac{1}{2}$	10 $\frac{3}{8}$	100
1	CRV-66147	Antenna		25 $\frac{3}{8}$	22 $\frac{3}{4}$	31 $\frac{1}{2}$

IN MODULATOR-DYNAMOTOR COMPARTMENT

- 1 Set of operating spare tubes—1 of each type used
- 1 Headset
- 1 Headset extension cord
- 1 Lip microphone
- 1 Microphone extension cord
- 1 Telegraph key without knee clamp

ACCESSORIES

WITH ANTENNA

- 1 Shipboard clamp
- 2 Transmission line connectors (loose)
- 1 Coupling adaptor unit

IN ACCESSORY BOX

- 2 Interconnecting cables
- 1 Battery cable, with clips
- 1 Input power cable
- 1 Set operating spares, less tubes
- 2 Plugs for power supply cable

COMPONENTS OF BASIC MAR EQUIPMENT

The radio components are assembled in two watertight metal cases of the same form and size. The Transmitter-Receiver case contains the radio frequency sections of the transmitter and the complete receiver assembly. The Modulator-Dynamotor Unit contains the speech amplifier circuits for modulating the transmitter and a dynamotor to provide the high voltage plate current for the operation of transmitter and receiver from a 13 v. d-c source. A compartment at the right of the case carries spare tubes and the operating accessories, such as lip microphone, headset, and waterproof key with necessary extension cords.

Both cases have metal covers fitted with rubber gaskets to assure the units remaining watertight even upon complete immersion, doubly protecting the equipment from moisture during shipment. An assembly to be fitted with rubber shock mounts is provided for installing the equipment in positions subject to vibration or shock. This mounting assures satisfactory operation on radio jeeps and in shipboard installations where a special frame is included in the adaptation kit.

The transmitting and receiving equipment may be operated directly from a 13 volt d-c source. Thus, on a radio jeep or landing barge, where such cur-

rent is usually available, no adaptation is required and the apparatus may be connected direct to the supply lines. In other installations where 24, 110 or 220 v. d-c or 110/220 v. a-c must be utilized as the source of power, a Universal Power Unit having the same form as the radio units and shock mounting in a similar manner is employed to provide current of the correct characteristic for operating the equipment.

The cases are formed from aluminum, with the sides and ends corrugated to add strength and to keep down the weight factor. Handles for carrying the equipment are located on the ends of the radio components. The entire equipment is finished in dull Marine green.

The antenna is of the dipole type, fitted with clamps for mounting on any elevated support, the transmission line is made up to proper length from stock coaxial cable in shipboard installations. Field kits include assorted cables for antenna installation.

Two distinct types of installations are made possible by suitable application kits. One kit is used with shipboard installations, the other for field applications. The kits and the accessories furnished differ and will be considered separately.

SHIPBOARD APPLICATION KIT

The major radio components of the shipboard kit are shown on the opposite page with operating accessories. A list of the components with size

and weights is also given. In addition to basic units, the kit includes the necessary items to complete the installation as listed in the table.

KIT UNITS

QUAN.	NAVY TYPE NO.	UNIT	WIDTH INCHES	DEPTH INCHES	HEIGHT INCHES	WEIGHT POUNDS
1	CRV-10506	Bulkhead mounting cradle with 3 shockmounts	27 $\frac{1}{8}$	19 $\frac{1}{8}$	30 $\frac{7}{8}$	150
1	CRV-10507	Shockmount	19 $\frac{3}{4}$	2 $\frac{1}{2}$	14 $\frac{7}{8}$	23
2		Junction Boxes	8	4 15/16	10 $\frac{1}{8}$	7

HARDWARE FOR MOUNTING CRADLE

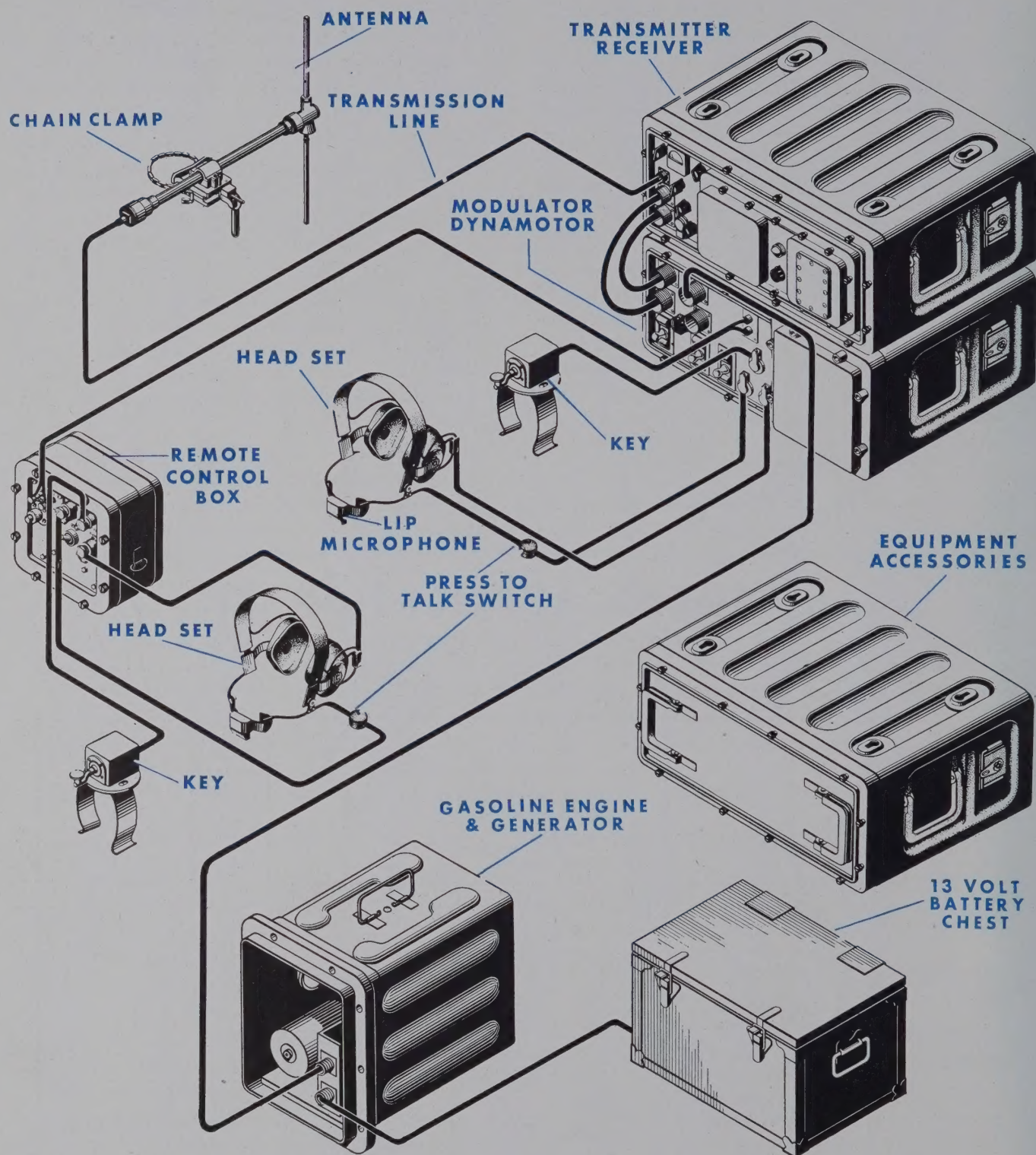
QUAN.	ITEM	SIZE
8	Hex. head capscrews to mount cradle	$\frac{3}{4}$ " x 2 $\frac{1}{2}$ "
8	Hex. nuts, washers and lockwashers	$\frac{3}{4}$ "
8	Hex. head capscrews	$\frac{3}{8}$ " x $\frac{5}{8}$ "
4	Hex. head capscrews	$\frac{3}{8}$ " x 1"
12	Lockwashers	$\frac{3}{8}$ "

To attach shockmount

ACCESSORIES

- 1 5 ft. microphone cord and plug
- 1 5 ft. phone cord and plug
- 1 Type UG-23/U jack
- 2 Type UG-167/U reducing connectors
- 1 Type UG-29/U adaptor
- 1 Type UG-21/U plug

MAR FIELD APPLICATION



FIELD APPLICATION KIT

The components of the MAR radio equipment as applied to field use in isolated locations are shown in the illustration opposite. The two basic radio units are identical to those used in shipboard installations, the field application kit providing the other units and accessories shown and listed below.

The antenna and accessories include a chain clamp for attaching the antenna to a tree, pole, or other similar support. A transmission line is furnished, 10 feet long, fitted with plugs, and ready for connection to equipment and antenna. An additional antenna transmission line 50 feet long is furnished in the accessory case.

A remote control box is supplied with the field kit, in a canvas carrying bag with necessary operating accessories consisting of headset, lip microphone, and extension cords for both. A key with

leg strap is included, the strap is fitted over the operators thigh to form a support for the key in field use. A second leg strap for use with the key in the basic equipment is also supplied.

Shock mounts are seldom necessary in field equipment unless they are employed in radio jeeps, when the shock mount base or shipboard cradle could be used. For field use, two pair of cabinet fasteners are provided so the radio components may be stacked and clamped together.

The primary power source consists of a gasoline engine driven 13 V d-c generator mounted on a base and fitted into a metal carrying case. The weight of the unit is low enough to permit one man to handle it with ease. A two wire cable, 25 feet long, is furnished to connect the engine driven unit to the radio equipment.

A storage battery case is also furnished, when transportation permits, and a cable is furnished to connect battery box to generator unit. The use of a battery assures continual operation of the equipment even when it becomes necessary to shut down the engine for adjustment or repair.

KIT UNITS

QUAN.	NAVY TYPE	UNIT	WIDTH INCHES	DEPTH INCHES	HEIGHT INCHES	WEIGHT POUNDS
1	CRF-10402	Gas Engine driven generator	11 $\frac{3}{4}$	18 $\frac{3}{4}$	14 $\frac{3}{4}$	
1		Battery Chest with 2-CRF-19017 Batteries	21	16 $\frac{3}{4}$	14	
1	CRV-10485	Accessory Box	21	14 $\frac{3}{8}$	9	
1	CRV-23485	Remote control	7 $\frac{1}{4}$	7	5	4
1	CRV-66147	Antenna in case	25	25 $\frac{3}{8}$	22 $\frac{3}{4}$	3 $\frac{1}{2}$

ACCESSORIES

IN ACCESSORY CASE

- 1 Gas Engine to modulator cable
- 1 Battery interconnecting cable
- 1 Set gas engine operating spares
- 1 50 ft. antenna cable with plugs.
- 1 Telegraph knee clamp
- 2 Pair cabinet attachments

WITH ANTENNA

- 1 Chain clamp
- 1 10 ft. antenna cable with plugs

WITH REMOTE BOX IN CANVAS BAG

- 1 Headset and cord
- 1 Telegraph key with knee clamp
- 1 Microphone
- 1 Microphone extension cord
- 5 Trunk type field shipping chests for MAR basic equipment and above field kit.

MAR TUBE COMPLEMENT

TRANSMITTER-RECEIVER

SYMBOL	TYPE	FUNCTION	USE
V-101	829-B	IPA	T
V-102	2C39	Tripler	T
V-103	2C39	PA	T
V-201	9003	R-F Amplifier	R
V-202	6AK5	1st Detector	R
V-203	6J6	3rd Tripler	R
V-301	12SG7	1st I-F Amplifier	R
V-302	12SG7	2nd I-F Amplifier	R
V-303	12SG7	3rd I-F Amplifier	R
V-304	12SG7	4th I-F Amplifier	R
V-305	12H6	2nd Det. & AVC	R
V-401	12H6	Noise Peak Limiter and Meter Rectifier	R
V-402	12SL7GT	Silencer Amplifier and 1st Audio Amplifier	R
V-403	12A6	A-F Output (power amp.)	R
V-501	6AG7	Converter	T-R
V-502	6C4	2nd Tripler	T-R
V-503	6C4	1st Tripler	T-R
V-504	6AG7	Crystal Osc. and Doubler (Channel)	T-R
V-505	6C4	Beat Crystal Osc. (10.066 mc)	T-R

MODULATOR-DYNAMOTOR

SYMBOL	TYPE	FUNCTION	USE
V-701	12SL7	Sp. Amp. and Phase Inverter	T
V-702	6L6GA	Modulator	T
V-703	6L6GA	Modulator	T

UNIVERSAL POWER SUPPLY

SYMBOL	TYPE	FUNCTION	USE
V1201	3B25	Rectifier	T-R
V1202	3B25	Rectifier	T-R

T—Used in Transmitter Circuit. R—Used in Receiver Circuit.

TECHNICAL SUMMARY

TRANSMITTER-RECEIVER NAVY TYPE CRV-43067

CHARACTERISTIC	TRANSMITTER	RECEIVER
Frequency Range	225-390 Megacycles	225-390 Megacycles
Frequency Stability	$\pm 0.007\%$	$\pm 0.007\%$
Tuning Bands	1	1
No. Pre-set Frequencies	10	10
Type of Circuit	Crystal controlled Oscillator	Superheterodyne
Crystals	10 Channel Frequency crystals 1 Beat Oscillator crystal	
Sensitivity		10 Microvolts
Selectivity		250 kc bandwidth at 6 db
Silencer Circuit		Operates 6 db change
Input Power		
Input Voltage	13V d-c or a-c 375V d-c	13V d-c or a-c 375V d-c
Output Power	8-10 Watts	1 Watt
R-F Impedance	50 ohm output	50 ohm input
A-F Impedance	8800 ohms input	600 ohm output
A-F Output Frequencies		300-3000 cycles

MODULATOR-DYNAMOTOR NAVY TYPE CRV-50248

CHARACTERISTIC	
Types of Modulation	MCW and Phone
Modulation Capability	100%
A-F Input Impedance	100 ohms
A-F Output Impedance	8800 ohms
Input Voltage	13V d-c or a-c. 375V d-c.

QUICK REFERENCE DATA

Equipment	Model MAR radio transmitting and receiving equipment.	
Contract	NXrs-60008	
Contractor	RCA Victor Division of the Radio Corporation of America, Camden, N. J.	
Naval Inspector	Resident Inspector of Navy Material, RCA, Front and Cooper Streets, Camden, N. J.	
Number of Packages in complete shipment	Basic MAR Equipment Shipboard application Field application	
Cubic Contents of complete shipment	Basic MAR Equipment	Cu. Ft.
	Shipboard application	Cu. Ft.
	Field application	Cu. Ft.
Total Weight of complete shipment	Basic MAR Equipment	lbs.
	Shipboard application	lbs.
	Field application	lbs.

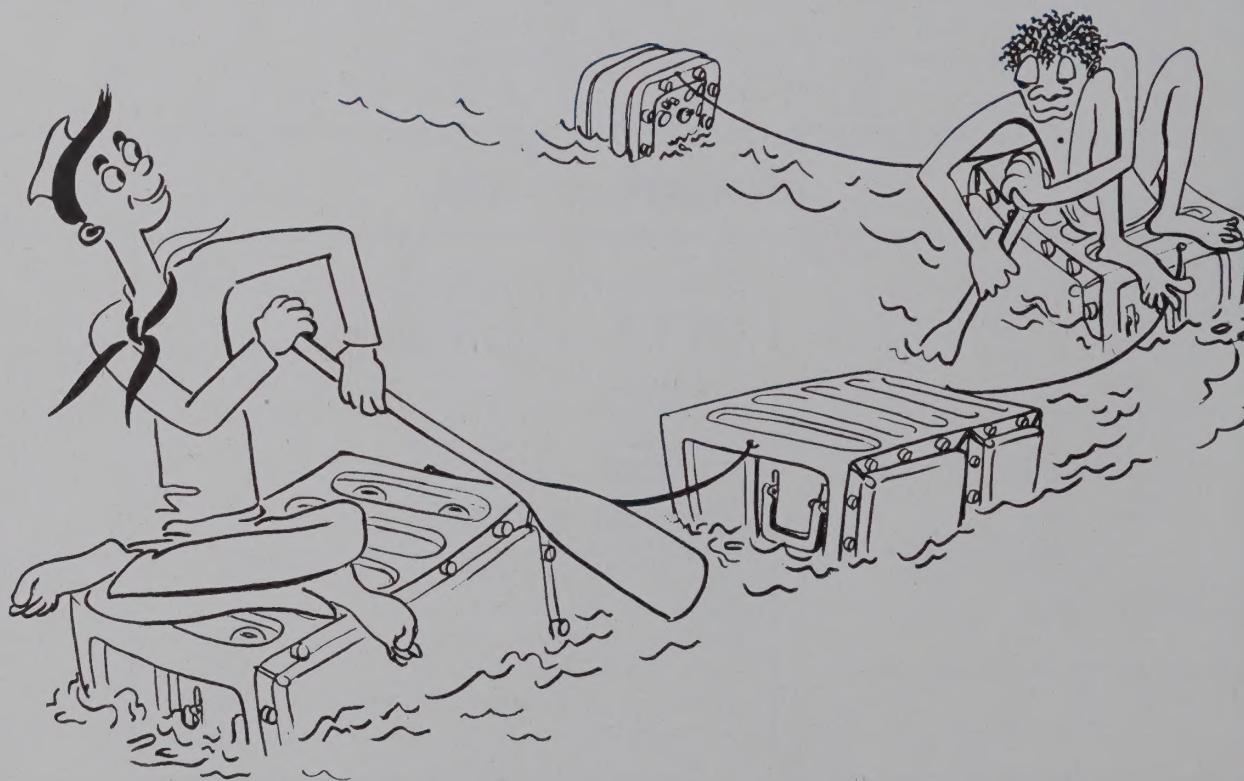
TYPICAL SHIPBOARD SHIPMENT

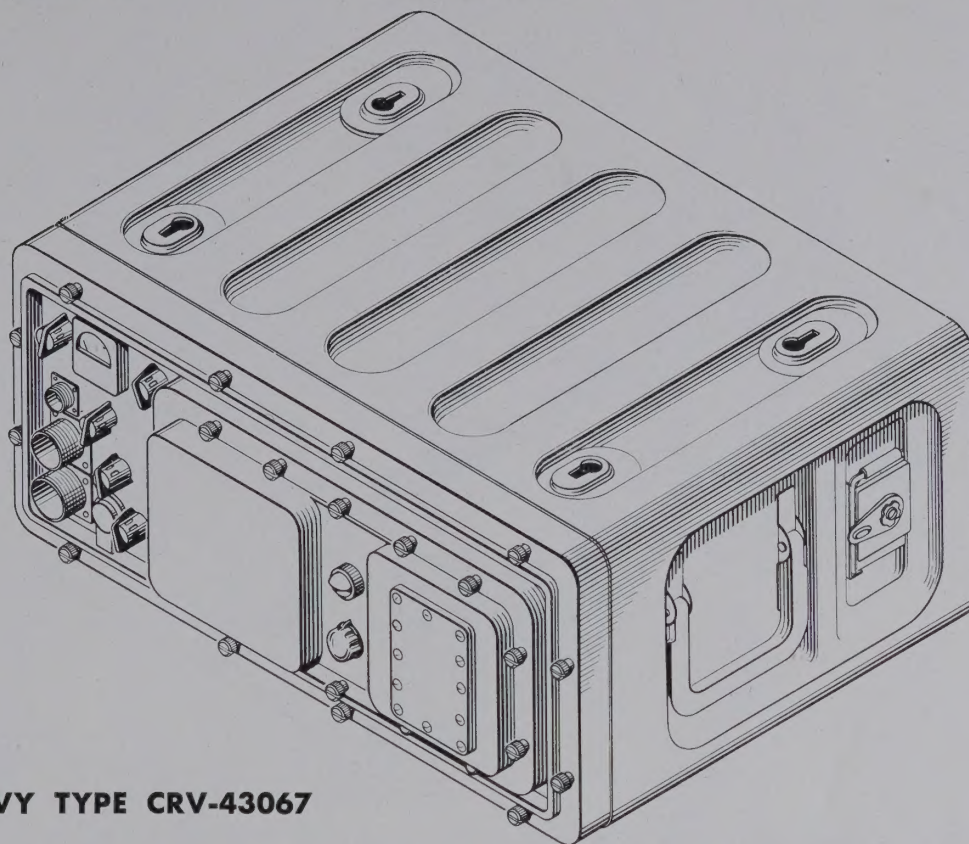
CRATED

CASE NO.	UNIT	CONTENTS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	VOL. CU. FT.
1	Basic	Transmitter-Receiver Modulator-Dynamotor	27½	25	22	8.8
2	Basic	Power Supply Unit	26½	19	15	4.4
3	Kit	Cradle Assembly	41	30½	22½	16
4	Kit	Shockmount Junction Box Accessories	20	15½	14½	2.2
5	Kit	Antenna and Accessories	31	19½	11½	4

SPARE PARTS

2	Cases	Equipment	36	18	18	6.75
3	Cases	Tender	36	18	18	6.75
		Stock	Assorted Boxes			





NAVY TYPE CRV-43067

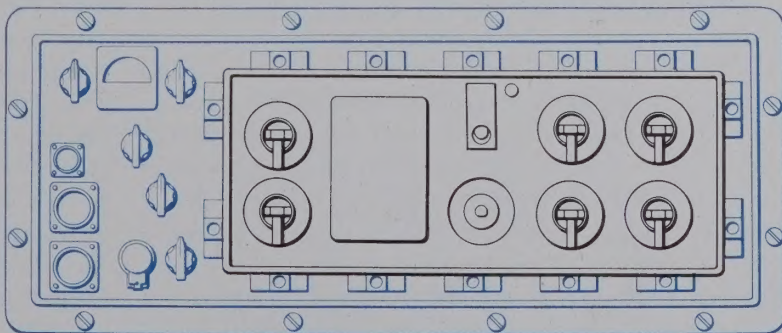
TRANSMITTER AND RECEIVER UNIT

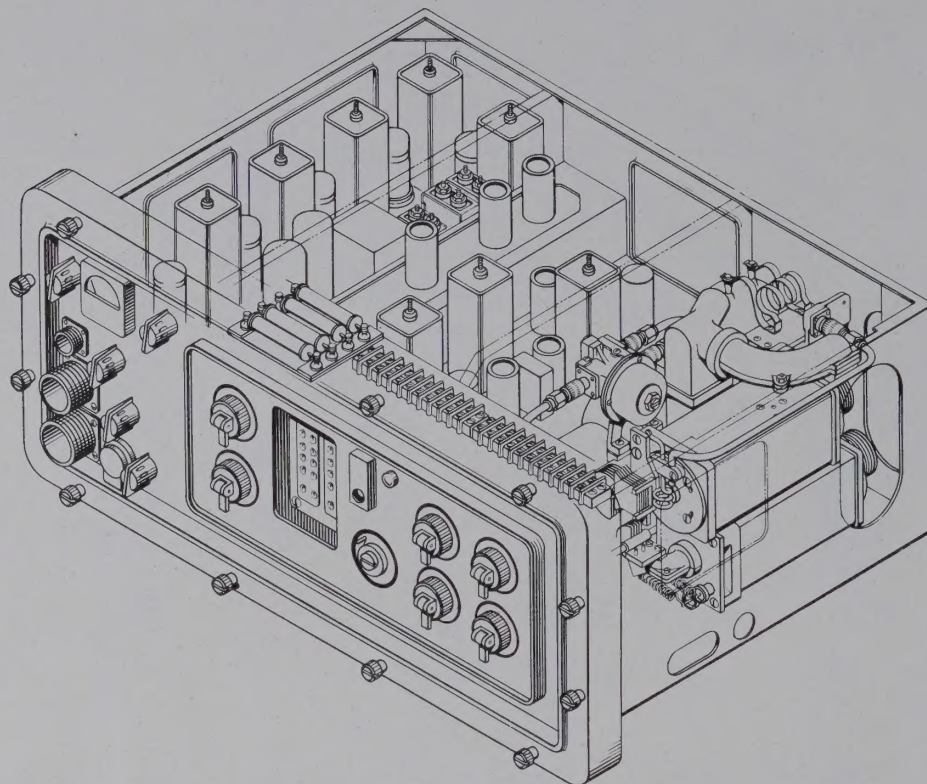
The radio frequency components of the transmitter and the radio receiver of the Basic MAR are contained in the unit shown. When set up for operation in field applications, this case is usually clamped to the top of a similar case containing the modulator section of the transmitter-dynamotor for plate supply voltage and operating accessories, by a pair of cabinet fasteners furnished with the field application kit. In shipboard or radio jeep installations it is hung from the underside of the top of a cradle.

When the outer watertight cover of the transmitter-receiver is removed by means of the wrench attached to end of the unit it will be found that the operating controls are mounted on an exposed panel at the left. Tuning controls and crystal oven are protected by a second cover plate fitted with a knob for operating the channel selecting switch and a hooded indicator and panel light. Removal of this second panel is necessary only when tuning adjustments are to be made or crystals changed. The equipment is designed to operate on ten pre-set crystal controlled frequencies, any of which may be selected by rotating the Channel Selector switch above mentioned.

The actual tuning of both the transmitter and the receiver is accomplished by a motor driven automatic tuning mechanism under control of the Channel Selector switch. The tuning controls on the right hand panel are really a group of mechanical selector mechanisms that can be set by means of an unlocking, tuning, locking sequence to pre-select the ten different frequencies. After the selectors have been adjusted they require no further attention unless tubes or parts are replaced, when the settings may need rechecking. For this reason the secondary cover is left on the selector panel for normal operation.

The cap on the pilot light on the panel is arranged to rotate and is used to control the amount of illumination on the panel or cut it off completely.





TRANSMITTER-RECEIVER CHASSIS

The chassis of the Transmitter-Receiver is divided mechanically and shielded electrically into six major sections as indicated in the view of the chassis shown above. These are known in the order they are to be discussed as:

- Frequency Multiplier Section
- Receiver Radio Frequency Section
- Receiver Intermediate Frequency Amplifier Section
- Receiver Audio Frequency Amplifier Section
- Transmitter Section
- Automatic Channel Selector

FREQUENCY MULTIPLIER SECTION

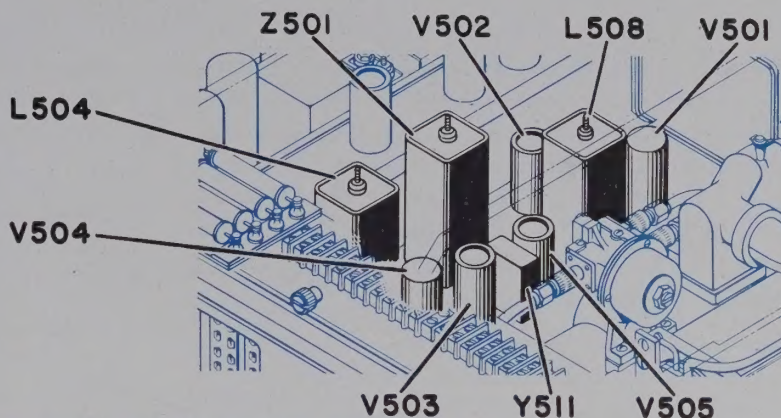
The purpose of this section shown isolated for discussion in the illustration is to provide the proper operating frequencies for the transmitter and the heterodyning frequency in the receiver section.

It accomplishes this by utilizing a crystal in the crystal oven on the panel, as selected by the selector switch, as the control for the fundamental frequency of the oscillating circuit in one section of the tube V504. This frequency is doubled in the other section of V504 and tripled twice by tubes V503 and V502. The output current of V502 is divided, a portion being fed into a third tripler located in the receiver radio frequency amplifier

section, thus providing the heterodyning currents for the receiver.

The other portion of the output from V502 is combined with the output of the fixed beat oscillating tube V505 by means of the converter tube V501. The fixed oscillator is controlled by crystal Y511 to operate at a frequency of 10.066 megacycles. The difference component, of the two frequencies fed into the converter tube V501, is selected in its output and fed to the power amplifier. The frequency is again tripled in the transmitter section to obtain the channel frequency for transmission. This circuit results in an appreciable saving in the number of crystals required for a given number of operating channels.

The three coupling transformers for the multiplying stages are shown on top of the chassis, adjustable cores being used in these units. The variable capacitors for tuning the frequency multiplying circuits are ganged and mounted inside the case of the unit. The capacitors are coupled to the selector on the panel by means of a shaft extending from the end of the casing of the unit.



RECEIVER RADIO FREQUENCY SECTION

The radio frequency section of the receiver, shaded in the view given on this page, consists of one radio frequency stage tuned to signal frequency, V201, the third tripler for the heterodyning frequency, V203, and the 1st detector or mixing tube V202.

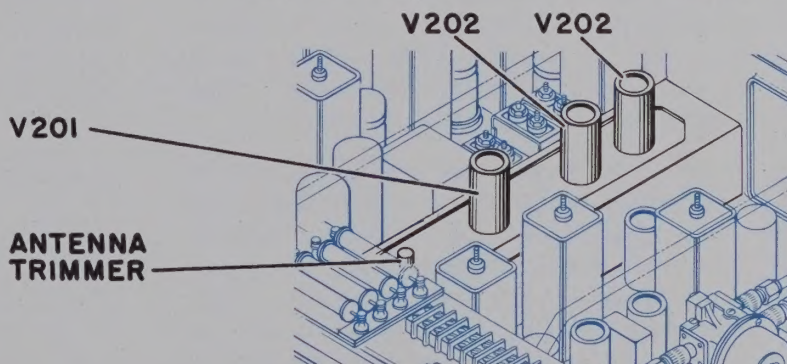
The above tubes are mounted on the top of the metal case that carries in its interior a gang of ten variable capacitors and associated tuning inductances. The capacitors are grouped in five pairs, each pair forming the tuning element of one of the five resonant circuits involved.

A tuned antenna circuit is inductively coupled to the tuned input circuit of the radio frequency amplifier tube V201. The coupling is such as to provide maximum signal gain consistent with good selectivity. The output circuit of the RF amplifier stage is tuned and likewise coupled inductively to the tuned input circuit of the first detector. This second tuned coupling arrange-

ment acts to improve the signal to noise ratio and maintain selectivity against image and other spurious responses.

Another pair of variable capacitors is used to tune the plate circuit of the heterodyning frequency tripler, V303, the output of which is inductively coupled into the 1st detector to obtain the heterodyning action in the latter tube.

The ganged capacitors in the unit are driven through a shaft that extends from the end of the assembly and couples to the selector marked RF.

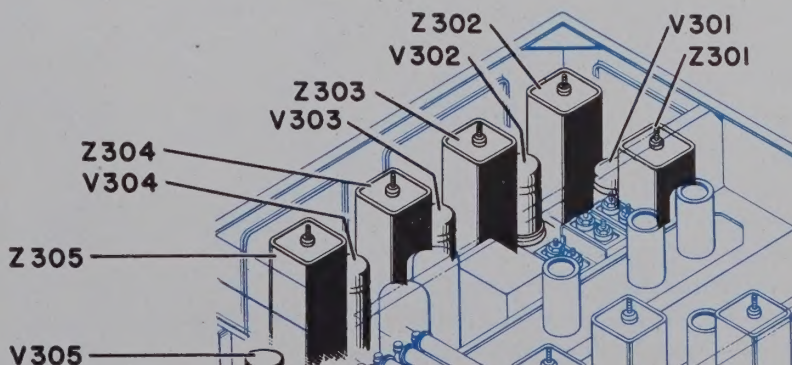


RECEIVER INTERMEDIATE FREQUENCY AMPLIFIER SECTION

The inverted L section at the left of the chassis contains the transformers and tubes of the intermediate frequency amplifier, and second detector. Five fixed tuned transformers, fitted with adjustable cores and fixed capacitors, serve to couple the four stages of amplification and diode detector V305.

From the output current components of the 1st detector in the RF section, the transformer T301 selects the 30.2 megacycle frequency for amplification. Four tubes, V301, V302, V303 and V304 coupled by the associated transformers, provide high amplification to feed the 2nd detector V305. V305 is a double

diode, provides AVC control and acts as a detector. Necessary by-pass capacitors, biasing and filter resistors for the amplifier are mounted beneath the chassis, readily available from the bottom.



RECEIVER AUDIO FREQUENCY AMPLIFIER SECTION

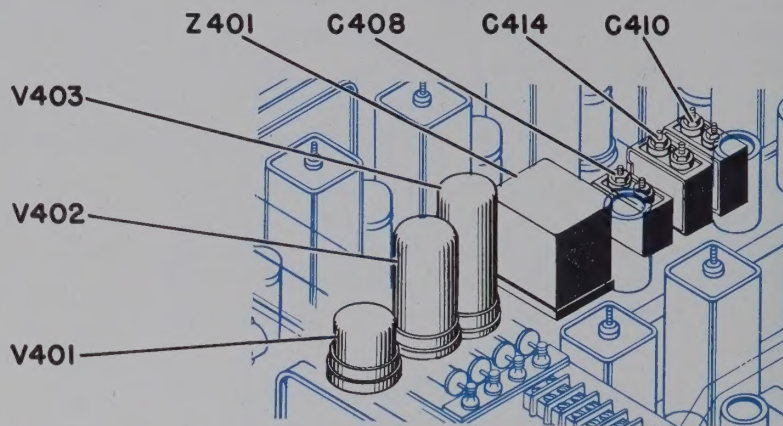
The three tubes in the audio frequency section of the receiver function as noise peak eliminator, meter rectifier and noise silencer, in addition to providing two stages of audio frequency amplification. The equipment is designed for headset reception, so the audio gain need not be great or the output high, but 1 watt output is available for loudspeaker operation if desired.

The first tube in this section, V401, is a double diode, one section being connected to act as a rectifier in the panel meter circuit when readings are taken with a-c supply. The second section of the tube acts as a noise peak eliminator, cutting off signals during noise peaks.

The second tube in this section, V402, is a double triode, one section acting as the "silencer" amplifier, the other as the first stage of audio amplification. The silencer section of the tube functions to

control the bias on the grid of the amplifying section of the tube to render it inoperative and the receiver silent during no signal periods.

The final stage of audio amplification is obtained in tube V403, its output being coupled through the filtering network to the output circuit of the equipment.



TRANSMITTER SECTION

At the right of the chassis is assembled the transmitter section which employs three tubes as indicated in the illustration. This compartment mounts the antenna transfer relay, tuning motor relay and a small blower for cooling the tubes.

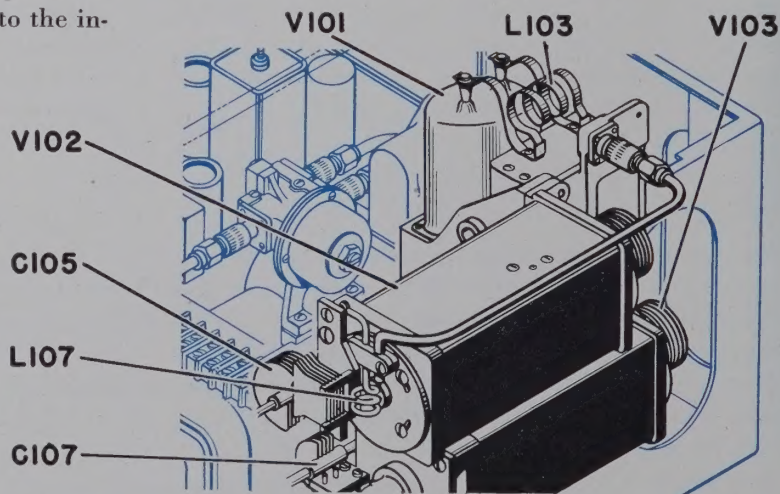
The input of the amplifier tube V101 is coupled to the output of the converter tube in the multiplier section by means of a link circuit. This first amplifier is of double pentode construction and works push-pull with its center-tapped plate inductance shown at L103. Tuning of input and output circuits of V101 is accomplished by means of variable capacitors coupled to the 1st IPA selector on the panel. The output is coupled through a link circuit, with a one-turn loop at each end, to the input of the tripler tube V102.

The tripler tube V102 is mounted in a metal housing with an inner metal tube attached to one end as indicated in the schematic circuit, page 2-26, in heavy lines around the tube.

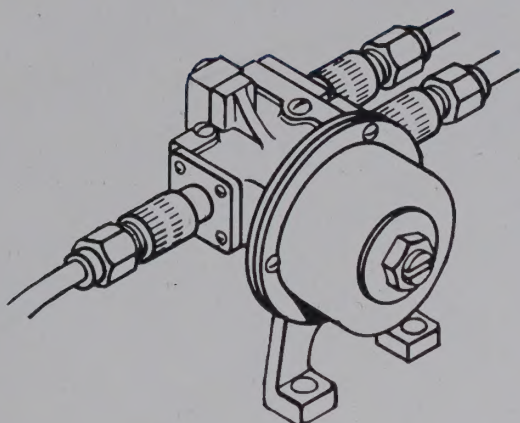
The metal housing and inner metal sleeve form a modified form of resonant tank circuit, the grid acting as a shield between cathode and plate circuits. The resonant frequencies of the grid-plate and grid-cathode tank are adjustable by variable capacitors controlled by the selector, 2nd IPA, on the tuning panel.

The power amplifier tube V103 is mounted in a manner similar to that employed with the tripling amplifier V102. The resonant concentric grid-plate tank circuit of this tube and half wave input line are adjusted by means of capacitors controlled by a common shaft coupled to the PA selector dial on the panel.

Output to the antenna is through a small coupling loop in the case forming the grid-plate circuit of the power amplifier, the loop being adjustable so the proper load impedance may be reflected back on the tube for maximum radio frequency output with permissible plate load. The coupling to the antenna is controlled by the Ant. selector dial.



THE ANTENNA TRANSFER RELAY

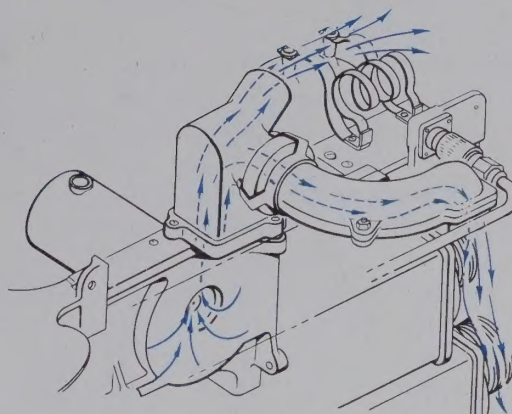


The antenna transfer relay is mounted in the power amplifier section in a prominent position and acts to transfer the antenna connection from the receiver to the transmitter section.

It consists of a solenoid winding in the circular case. The plunger of the solenoid is mechanically connected to a contact member connected to the lead from the antenna receptacle on the panel of the equipment. Normally this contact member closes the circuit to the receiver through one of a pair of fixed contacts in the relay. A coil spring acting on the solenoid plunger assures the above contacting when the relay is de-energized.

When current is applied to the relay winding, as when the press-to-talk switch is closed for the purpose of transmission, the plunger is pulled into the solenoid and the antenna contact member is forced over to close the antenna circuit to the transmitter section. On de-energizing the relay winding, the circuit to the receiver is again closed.

AIR CIRCULATOR



The case of the radio equipment being airtight and waterproof introduces the problem of preventing overheating of the equipment during long operating periods. Since air change is impossible, a blower is mounted in the lower section of the power amplifier section.

The blower consists of a small universal motor driving a centrifugal fan. The discharge of the fan is directed, by means of the round duct clipped to top of the tripler tube enclosure, to the cooling fins on the tripler V102 and power amplifier V103 tubes. A portion of the air is directed against the 1st intermediate power amplifier tube V101.

The blower operates continually during transmission periods with the result that the stream of air directed against the tubes holds down their temperature. The resultant circulation of the air in the interior of the case allows efficient use of the entire case surface for the radiation of the heat in the equipment to the atmosphere.

AUTOMATIC CHANNEL SELECTOR

The automatic tuning or channel selector mechanism is a compact motor driven device occupying the space behind the panel at the right of the chassis. The illustration shows the appearance of the unit with front panel removed. An additional view is given of a selector unit, which shows the shaft extending at the rear for couplings to the driven tuning components of transmitter and receiver circuits.

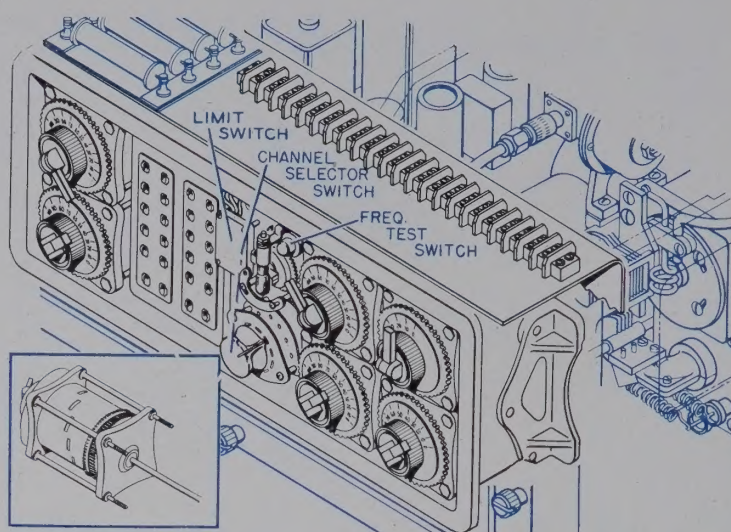
The selectors can be set to a series of ten frequencies as required for the crystals provided, by a sequence of adjustments. This involves the setting of the channel selector switch on the first

point, the tuning mechanism driving a switch that connects a crystal from the bank of ten in the crystal oven into the oscillator circuit. The selectors are then automatically positioned for the first tuning sequence. The selector dials are unlocked by raising the lever on the dials, the equipment tuned to the frequency selected, using the panel meter to determine resonance points and the dials relocked by depressing the levers. A setting of the channel selector switch is made for another frequency and the process of unlocking, tuning and locking the dials repeated. In this manner it is possible to pre-tune the equipment for ten frequencies within the

225 to 390 megacycle band, any of which being then available for use by simply rotating the selector switch to the frequency desired.

The mechanism is driven by a small motor in the rear, visible in the top view of the chassis. The sequence of operation is as follows: When the Channel Selector switch is moved to change the frequency, a section of the switch operates a relay to close the motor circuit. The motor turns all the selectors and the crystal selecting switch to a new position by means of worm and spur gears. The rotating mechanism drives a homing switch which acts to open the relay circuit when it reaches a point corresponding to the position of the selector switch. The opening of the relay circuit causes the relay armature to drop back and another set of contacts are closed that reverses the motor. The motor continues running in the reverse direction till the driving mechanism has returned to its original position, whereon the limit switch shown in the illustration is actuated by the arm, opening the motor circuit and stopping the motor, ready for another tuning excursion.

The selectors operate as follows. In the forward direction the motor drives an outer drum on each selector that has ten slots. Each slot corresponds



to one of the positions of the homing switch. Thus the slot corresponding to the position selected will stop in the proper location. A pawl for the position selected will be cocked and when the motor reverses its direction, the pawl will drop into a slot which will hold the shaft of the capacitor or other driven device at the desired position. As the motor drive continues in the reverse direction, a slipping clutch permits the selector drum to remain correctly positioned with the pawl latched into the proper slot. The reversing mechanism strikes a limit switch and the motor stops. In this position the pawls will be locked in and the equipment tuned to the new frequency.

THE CRYSTAL OVEN

NAVY TYPE CFT-40148

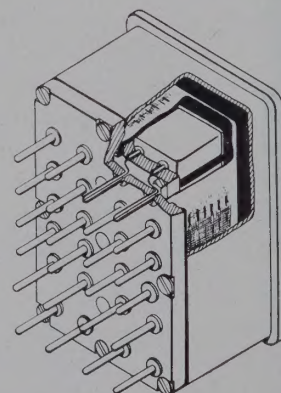
The ten crystals controlling the basic frequency generated in the oscillator section of V504 are grouped and mounted in the compact unit shown in the illustration. The crystals are of the hermetically sealed miniature type CR-7E/U and the terminal pins of the individual crystal holders fit into jacks inside the unit, that connect to pins on the rear of the unit. The cover may be removed from the unit for the replacement or installation of individual crystal holders.

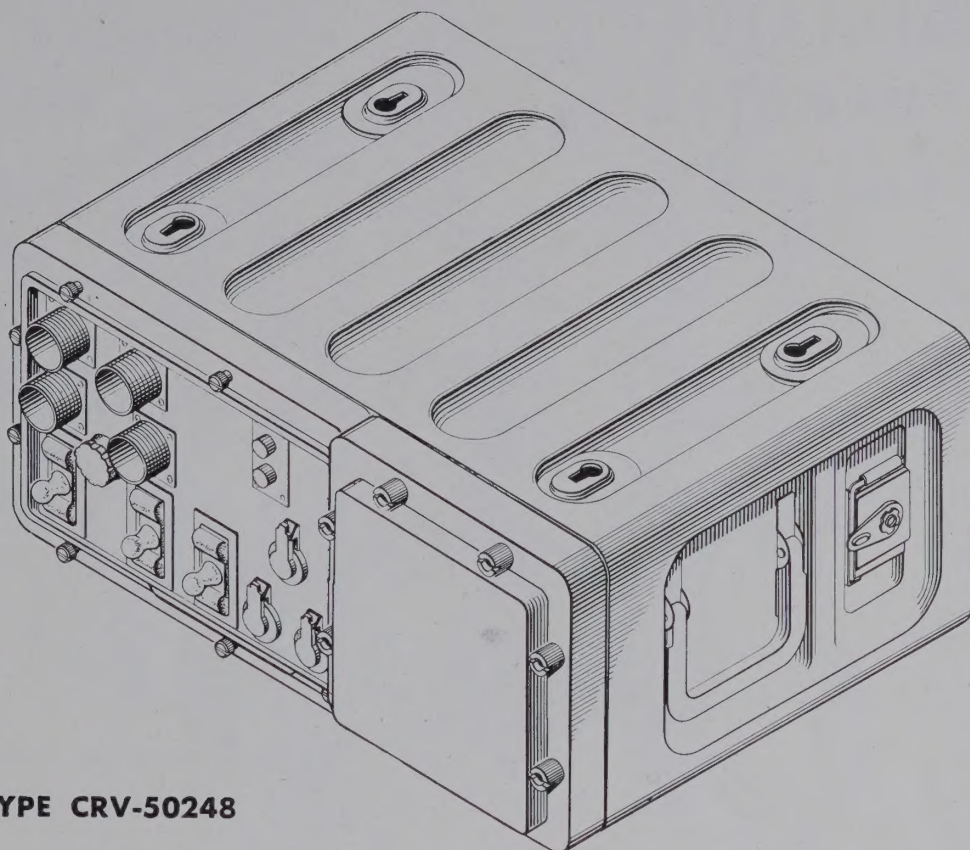
The unit is termed a Crystal Oven because it has two built-in thermostatically-controlled heating units to maintain the crystals at a fixed temperature. This prevents any shift in frequency that might occur with changes in the crystal temperature.

Of the two heating units provided, one is a booster unit intended to bring the temperature of the oven to operating temperatures as rapidly as possible when the equipment is first switched on. When the proper temperature has been reached, the booster

heater cuts off and the second heating unit functions to take care of any further fluctuations of temperature.

The crystal oven is fitted with twenty-four pins at the rear, twenty of the pins connecting to the ten crystal terminals while the other four pins are the heating unit terminals. The Crystal Oven shown in the illustration plugs into a jack panel in the receiver selector unit to make the necessary connections to the switching mechanism behind the jack panel. The crystal switching mechanism is coupled to the tuning-motor gear-train and functions to connect the proper crystal into the circuit for any setting of the selector dials.



**NAVY TYPE CRV-50248**

MODULATOR AND DYNAMOTOR UNIT

The partitioned metal case of the Modulator-Dynamotor Unit shown, houses in the left-hand section the audio amplifier used to modulate the carrier wave of the transmitter unit and 13V dynamotor unit. The circuit of the amplifier includes a switching arrangement that causes the generation of the 1200 cycle modulating frequency used in the MCW transmission.

The panel mounts the switches necessary for the control of the equipment, jacks and receptacles for the attachment of power supply and interconnecting cables, as well as jacks for the microphone, headset and telegraph key. Terminals are likewise provided for the attachment of the line wires to the remote control unit in field application.

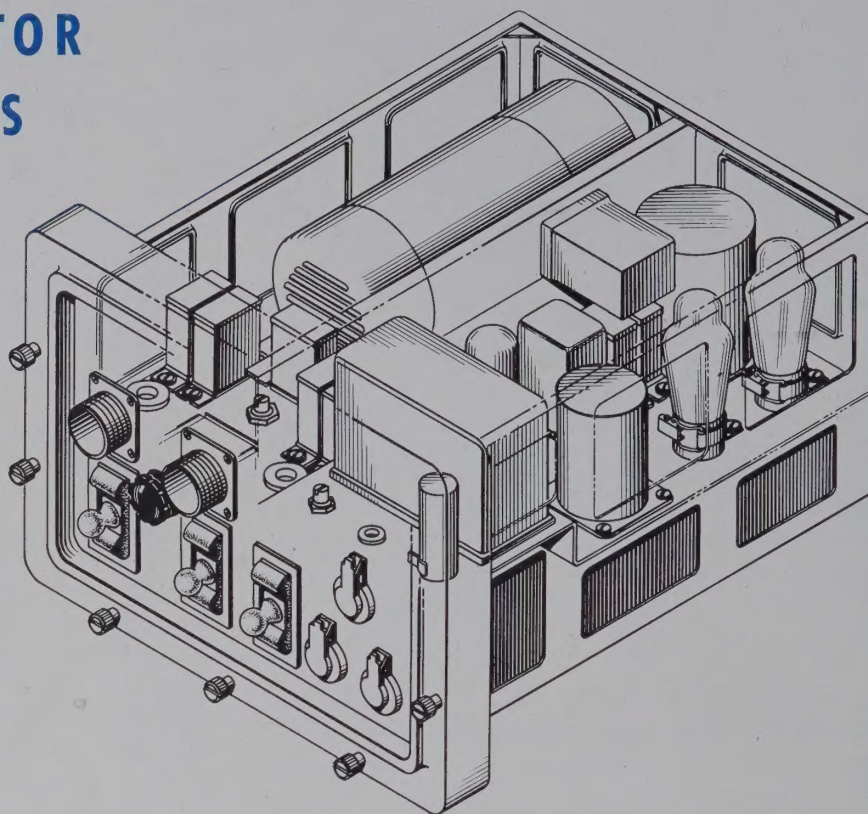
The right-hand section of the case provides a storage space for the accessories, a spare tube of each type used in the equipment being furnished.

Individual covers are provided for the two sections of the case. These covers are fitted with rubber gaskets to make a watertight seal when the covers are fastened in place with the thumbscrews. With

the cover removed, the equipment is still splash-proof in that switches are protected with a flexible rubber sheath and the jacks are fitted with hinged covers which must be raised to insert the plugs on the operating accessories.

The dynamotor housed in this unit furnishes the high voltage dc for the tube plate circuits and other purposes in the equipment where direct current is necessary. The unit consists of a 13V dc motor and 375V dc generator in a common housing, shockmounted to prevent vibration from affecting other portions of the equipment. A fuse is provided in the output of the generator to prevent damage to the unit from overload or short circuits.

MODULATOR- DYNAMOTOR CHASSIS



The chassis of the Modulator-Dynamotor unit is divided into two sections lengthwise as shown above in the top view of the chassis. The right-hand section contains the speech amplifying circuit for modulating the transmitter, the left-hand compartment mounting the dynamotor.

On top of the chassis in the speech amplifying section are mounted the three tubes and necessary transformers. Associated resistors and by-pass condensers are located below the chassis. The speech input transformer T703 has two primary windings, one to match the local microphone to the tube input impedance, the other to match the line to the tube. The secondary of the transformer is connected across a potentiometer mounted on the chassis to permit adjustment of the audio input to one section of the double triode tube V701. By means of a phase inverting circuit, the second section of V701 is activated to form the other half of a push-pull arrangement to drive the modulator tubes.

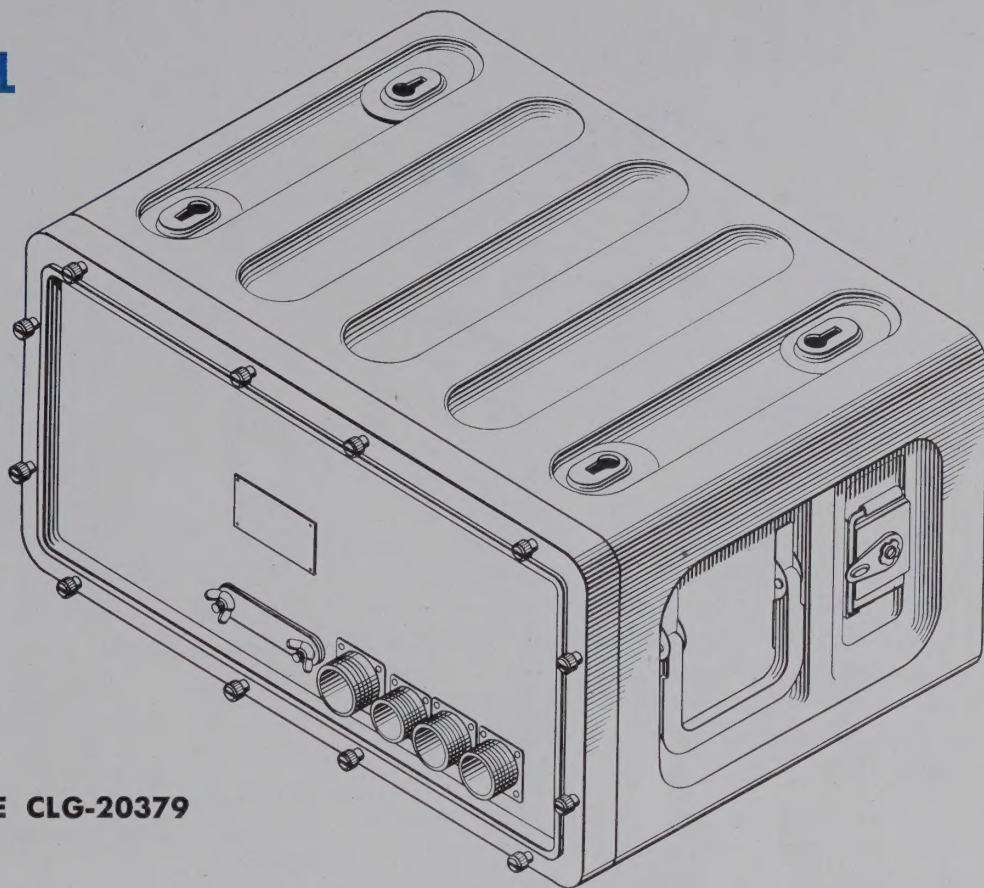
The output of tube V701 is resistance-capacity coupled into a push-pull modulator stage consisting of V702 and V703. The plate circuits of the

latter are coupled by modulation transformer T702 into the plate circuit of the power amplifier of the transmitter to furnish modulation.

A switching system controlled by the MCW-Phone switch is arranged to connect the windings of transformer T701 into the grid and plate circuits of the speech input section of V701. The audio oscillations thus generated serve to modulate the transmitter output when a key plugged into the jack on the panel is operated.

The dynamotor in the other section of the chassis is essentially a motor generator, the motor end being driven by the 13V direct current supply. Assembled in the same housing with the motor is a d-c generator capable of delivering 375 volts, direct current. This high voltage current is used for the plate supply for the tubes in both transmitter and receiver. The current for filaments and heaters of the tubes is obtained direct from the 13 volt supply. Necessary capacitors and filters are included to smooth out any ripples in the generator current and to prevent interference from brush action in the generator.

UNIVERSAL POWER UNIT



NAVY TYPE CLG-20379

For shipboard installations, where the primary source of power is other than 13V d-c, a universal power supply unit is furnished. The unit is installed beneath the cradle supporting the radio components and connected thereto by a cable.

The unit is mounted on a chassis contained in a watertight case with gasketed cover similar in appearance to the radio units but slightly larger in dimensions. The front panel is fitted with four receptacles as shown, the two at left for 26V d-c input and 110-220V input of either a-c or d-c. The other two receptacles are for output to the MAR transmitter-receiver and for a RDR receiver when combined with the equipment.

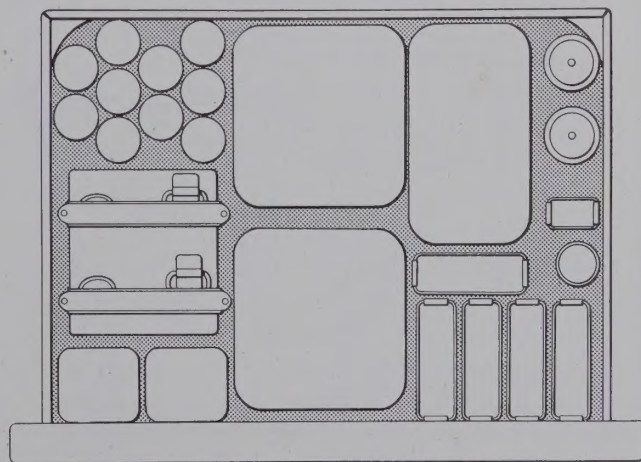
Switches mounted beneath the chassis, and accessible only on withdrawal of the chassis from the case, permit the setting of the supply unit to operate on 26V d-c, 115-230V d-c or 115-230V a-c. Variations from these voltages are compensated for by a Hi-Med-Low switch.

When operating on d-c, a system of vibrators is used to convert the input current to square wave a-c for operating transformers that supply both 13V output for the filament circuits of the radio equipment and the 365V for plate circuits. Two gas-filled rectifier tubes rectify the transformer

output and a filter system attenuates the a-c components of the output to a level inaudible in the receiver.

The components of the unit, including vibrators, transformers, rectifier tubes and filter system are mounted on top of the chassis as shown below. The smaller items, such as resistors, switches and capacitors, are beneath the chassis.

There are two 13V a-c outputs. The output for the MAR equipment capable of delivering 110 watts. The second, for the RDR, will furnish up to 50 watts. The nominal plate voltage output is 370V d-c with a load capacity of 225 watts.

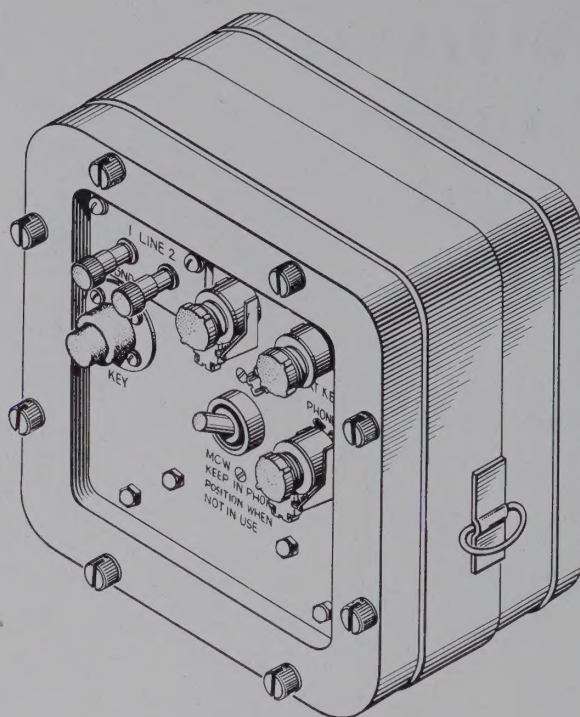


REMOTE CONTROL BOX

NAVY TYPE CRV-23485

Remote operation of the equipment, oftentimes being desirable or necessary, is made possible by this small unit illustrated, that may be located at any distance up to a mile from the radio components. A carrying strap is provided for slinging the box over the shoulder and the operator may walk about freely while operating the equipment. The only connection required between the control box and the radio equipment is a pair of wires which may be flexible rubber covered cord or, in field application, a pair of twisted telephone wires, type W-110-B.

The remote control unit permits both phone and MCW transmission and reception, necessary switches permitting the changeover while jacks accommodate the microphone and headset cords. A waterproof key is built into the box for MCW operation but a jack is provided for a loose key if desired. However, change in operating frequency is not possible by remote control. Three small dry cells enclosed in the case are required

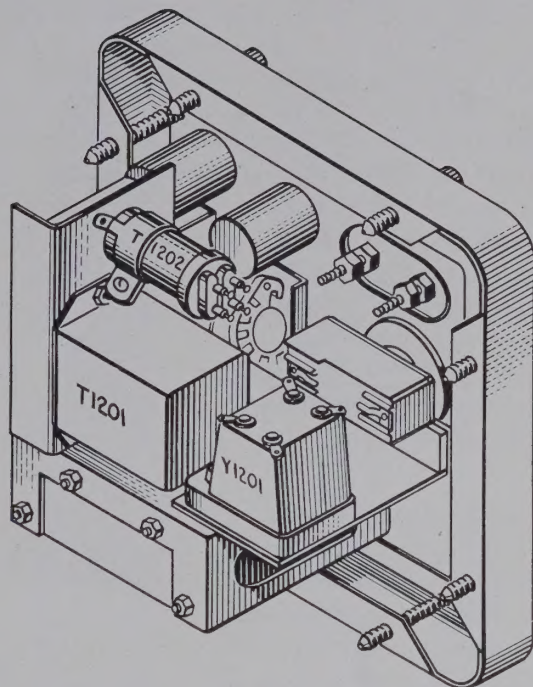


for operation, but their method of use gives them long life and the operator ample warning of their failure.

The unit is practically waterproof in operation since the jacks and switches are protected by flexible rubber fittings. A waterproof carrying bag is provided to accommodate the unit, the lip microphone, key, headset, and necessary extension cords furnished with this equipment.



REMOTE CONTROL BOX INTERIOR



The circuit components of the remote control box are mounted on the rear of the panel as shown. For the operation of the unit there are required three dry cells (not furnished) which are clipped into the compartments arranged at the bottom of the unit.

At T1201 is shown the line matching transformer with one primary winding and two secondary windings. The primary is the input winding for the microphone and local hummer which provides the modulating note for MCW operation. One secondary winding connects to the headset jack which results in the signals from the remote box, both voice and MCW, being heard in the headset. Incoming signals from the radio equipment are also fed to the headset through this winding. The other secondary winding connects to the line terminals of the unit to match the input impedance of the transmitter speech amplifier in the modulator unit.

The hummer shown at Y1201 generates the modulating tone for MCW transmission. This operates from the local battery and is similar in design to a buzzer, but a variable resistor similar to a carbon grain telephone transmitter button is used to vary the current through the electromagnet. The resultant variations in potential across the coil of the hummer are applied to the primary of the transformer T1202, the secondary of the transformer

being connected to the line terminals through the panel switch and local key and key jack. With the panel switch in the MCW position, the hummer operates continuously, signaling being done by keying the secondary circuit of transformer T1202, the resultant output modulating the transmitter. Keying can be done with the key mounted on the panel of the unit or the loose key plugged in.

With the MCW-Phone switch on the panel in the Phone position, the equipment is controlled by the press-to-talk switch built into the microphone extension cord. This switch closes a double set of contacts when pressed, one to close the microphone, battery and transformer circuit, the other placing the local battery in series with the line to assist in the operation of the relay in the transmitter that switches the radio apparatus from receiving to transmitting condition. This switch should be kept in the Phone position when equipment is not in use to conserve the battery.

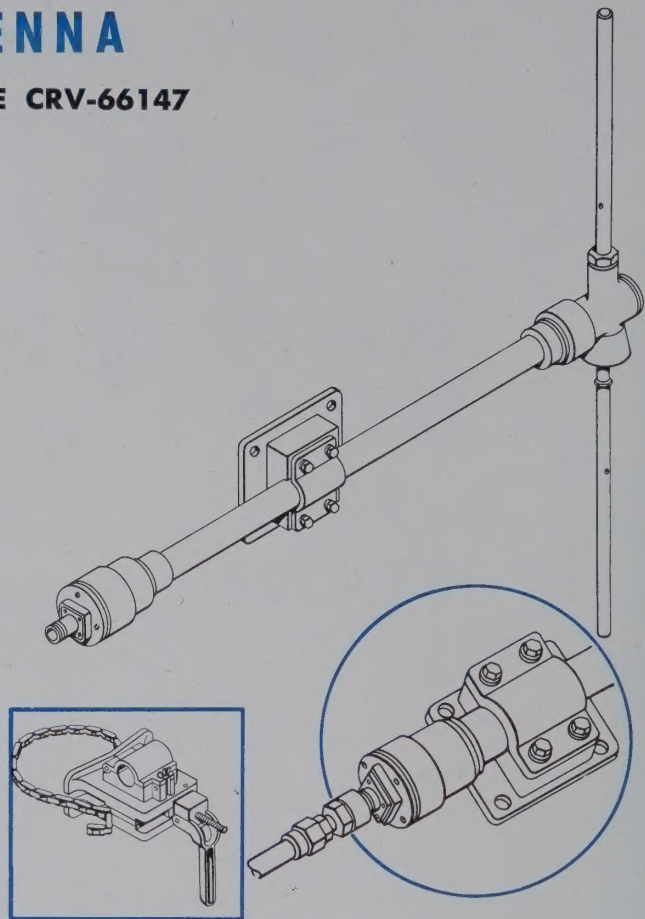
A switch on the panel of the Modulator-Dynamotor unit is used to disconnect the remote control box input from the radio equipment and connect it to the headset and microphone plugged into the modulator-dynamotor panel. The operator at the radio equipment can then communicate with the operator at the remote box without causing radio emission.

ANTENNA

NAVY TYPE CRV-66147

The antenna is of the halfwave, center-fed dipole type and is furnished complete with bracket for mounting as shown in the illustration for ship-board installations. The two radiating rods extend at right angles from the end of the tubular mounting member and are screwed into threaded studs for assembly. One rod is grounded to the supporting tube and outer conductor of the coaxial transmission line. The "live" rod, extending downward, is supported by an insulated stud connected to the center lead of the antenna.

The antenna is designed to have an impedance of approximately 50 ohms with characteristics that result in good matching with the transmission line over the full frequency range of 225 to 390 megacycles used in the equipment. No alterations or adjustments of the antenna being necessary when frequency changes are made. The chain antenna clamp is used with field applications.



HEADSET-LIP MICROPHONE

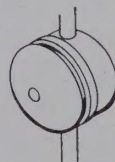


Headset	Navy type—CW-49507
Headset extension cord	Navy type—CW-49534
Lip Microphone	Navy type—CW-51071
Microphone extension cord and press-to-talk switch	Navy type—CW-49561

The headset and lip microphone are clipped together to form a unit when in use. A leather covered headband, adjustable as to length supports the waterproof earpieces having a combined resistance of 600 ohms. An extension cord fitted with a plug and jack serves to connect the headset to the equipment. The headband is fitted with snap fasteners, onto which the microphone may be clipped.

The microphone, of the noise-cancelling, single-button, carbon type is to be fitted over the lip. Two flexible cords, fitted with fasteners, provide for clipping the cords to matching fasteners on the headband. The supporting cords of the microphone permit fitting the microphone snugly in place.

PRESS-TO-TALK SWITCH—An extension cord, fitted with a waterproof press-to-talk switch, is used to connect the microphone to the radio equipment. Operation of the press-to-talk switch controls the operation of the transmitter and receiver.

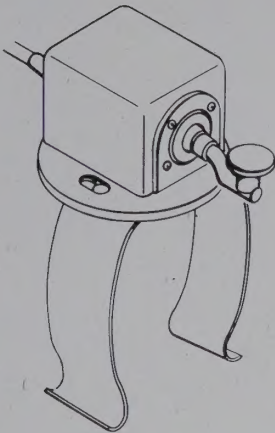


TELEGRAPH KEY

CAQZ-26022, KEY AND LEG CLIP

CAQZ-26026, KEY

CAQZ-10531, LEG CLIP



The key used is also of the waterproof type, with contact mechanism in a metal case. The lever of the key is fitted with a rubber sheath where it extends from the case. The circular base of the key has two keyhole slots.

The basic MAR equipment includes a plain key among its accessories. The field application kit remote control box is supplied with a key fitted with a leg clamp. The clamp is a flat spring member, fitted with a plate mounting studs, onto which the key can be clipped by means of the keyhole slots. A second leg clip is supplied in the field kit accessories to be used with the key supplied with the radio equipment.

EQUIPMENT MOUNTING ASSEMBLIES

The use of MAR equipment for both shipboard and mobile or field applications requires proper mounting arrangements to absorb shock and vibration. On the right are shown the three assemblies that may be assorted to meet practically any mounting condition.

The cradle shown at the top is built up of stainless steel tubing, welded to gusset plates at the corners and fitted with braces to form a rigid, light-weight mounting frame. Intended primarily for shipboard applications, where it is bolted to bulkhead or wall, it can be used also for floor mounting in mobile installations.

Beneath the top of the cradle and on the bottom inside are attached slides. These slides will receive the top member of the shockmount assembly shown. Thus by attaching the shockmounts to the basic units in the proper manner, one may be suspended from the top of the cradle while the other is supported from the bottom. This gives a grouping of the major radio units that may then be combined in various arrangements with other units or accessories.

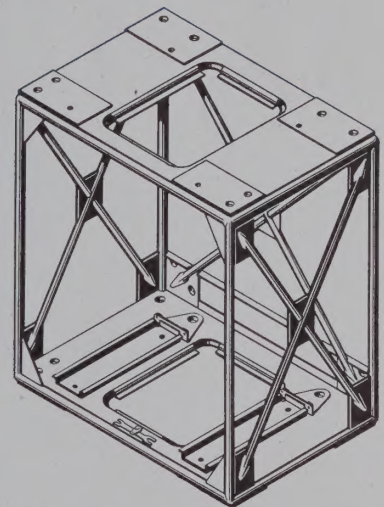
The shipboard installation is made up by suspending a power supply unit beneath the cradle from a shockmount base that can be fastened in place by capscrews and tapped holes in the bottom of the cradle.

In a similar manner, provisions are made for attaching the base of a shockmount assembly to the top of the cradle and thus a companion receiver may be clamped to the top of the cradle.

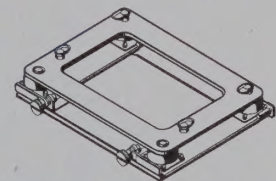
The shockmount assemblies may also be used to mount the equipment on any support by attaching the base member with bolts or lag screws to the support, and the equipment, after attaching frame and shockmount, can be slid into place and clamped firmly.

Under conditions where there is little vibration or shock expected, the cabinet fasteners are employed to clamp the units together. It is entirely possible to stack several units together to form a compact

installation by the use of the cabinet fasteners. These mounting assemblies are grouped into application kits and are furnished complete with all necessary hardware to make the desired installation.



CRADLE NAVY TYPE CRV-10506



**SHOCKMOUNTS
NAVY TYPE CRV-10507**



FASTENERS

NAVSHIPS 900,719



RESTRICTED

THEORY OF OPERATION

SECTION 2



M—A—R

RADIO TRANSMITTING AND
RECEIVING EQUIPMENT

RESTRICTED

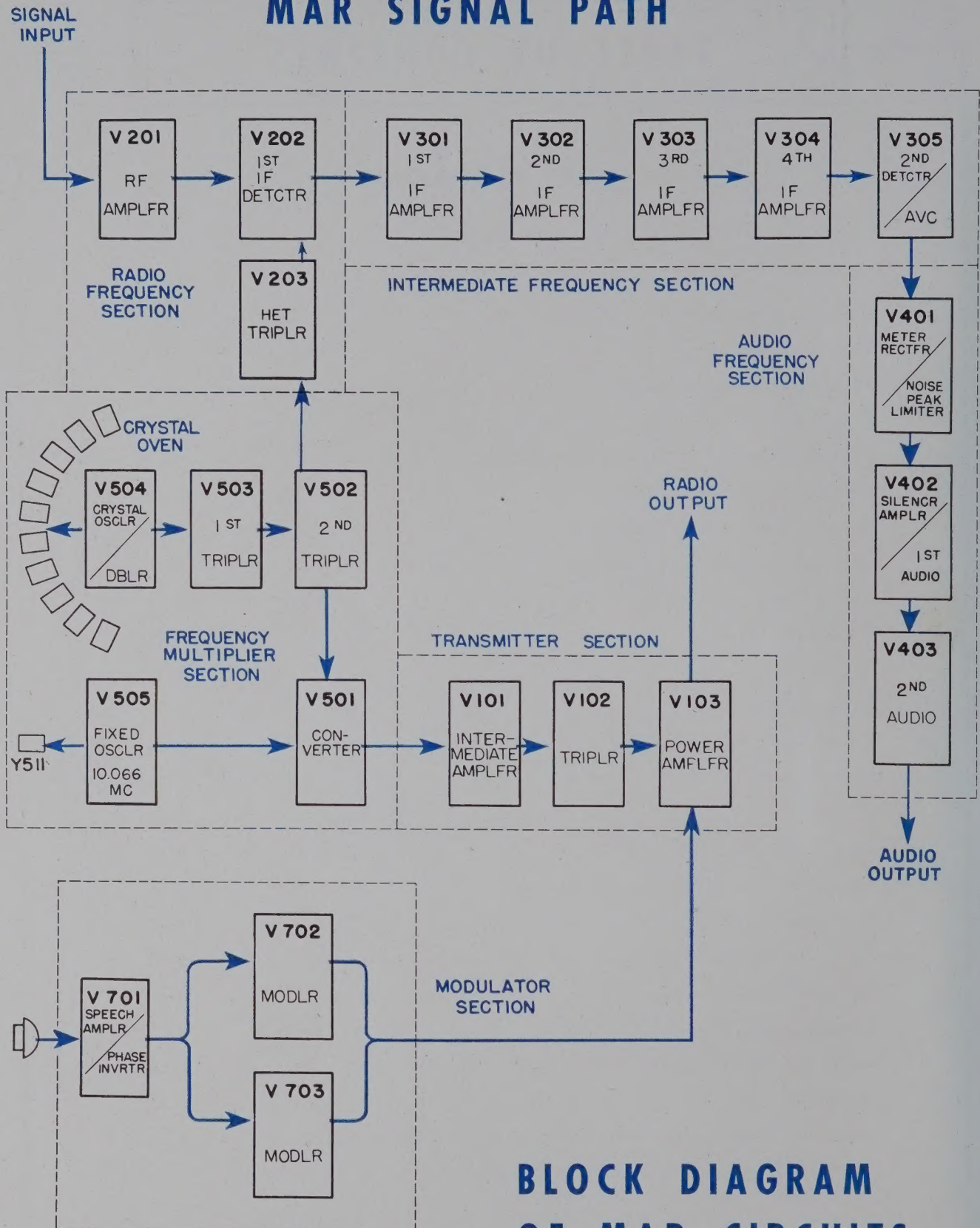
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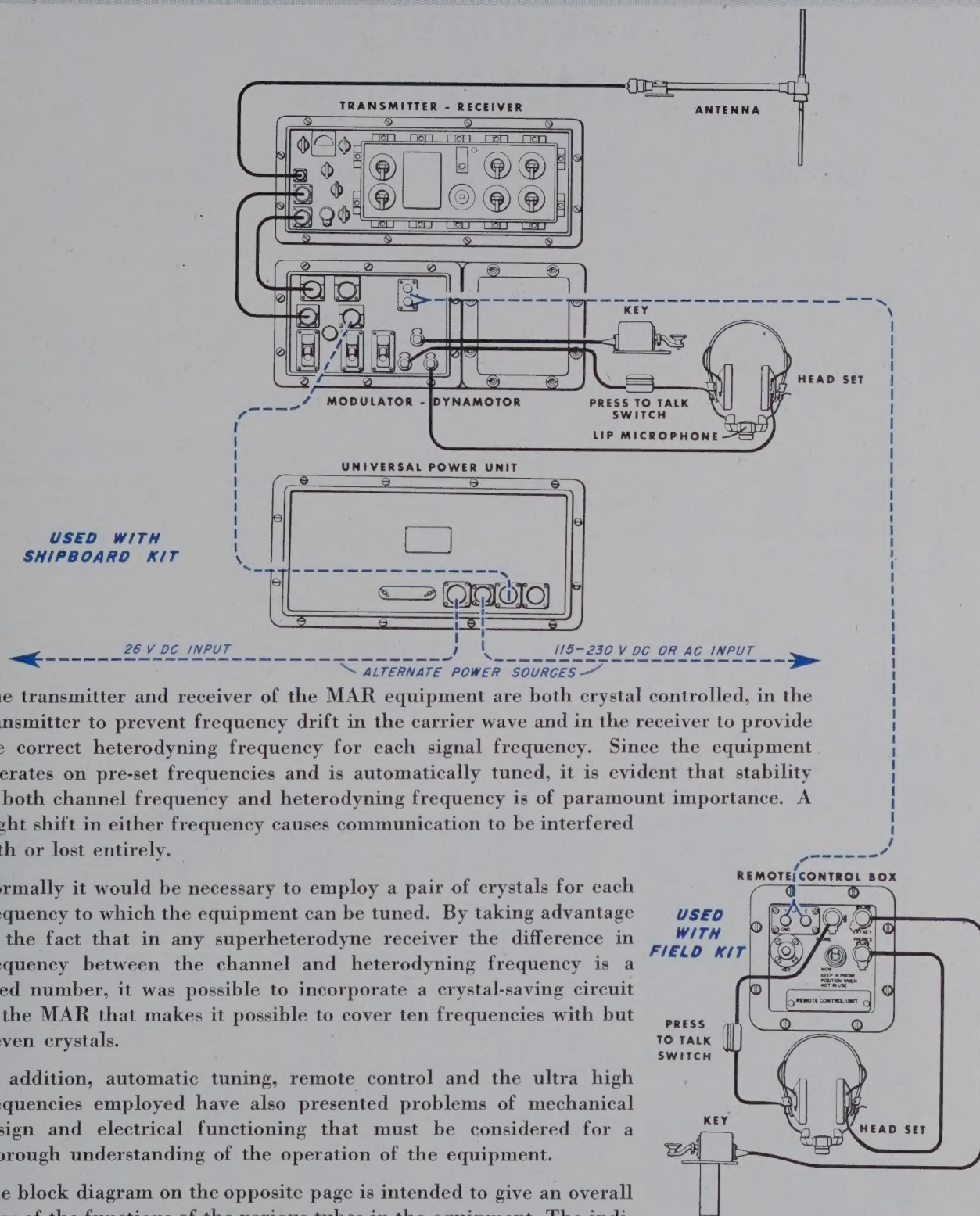
SECTION 2

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MAR SIGNAL PATH

BLOCK DIAGRAM
OF MAR CIRCUITS

THEORY OF OPERATION



The transmitter and receiver of the MAR equipment are both crystal controlled, in the transmitter to prevent frequency drift in the carrier wave and in the receiver to provide the correct heterodyning frequency for each signal frequency. Since the equipment operates on pre-set frequencies and is automatically tuned, it is evident that stability of both channel frequency and heterodyning frequency is of paramount importance. A slight shift in either frequency causes communication to be interfered with or lost entirely.

Normally it would be necessary to employ a pair of crystals for each frequency to which the equipment can be tuned. By taking advantage of the fact that in any superheterodyne receiver the difference in frequency between the channel and heterodyning frequency is a fixed number, it was possible to incorporate a crystal-saving circuit in the MAR that makes it possible to cover ten frequencies with but eleven crystals.

In addition, automatic tuning, remote control and the ultra high frequencies employed have also presented problems of mechanical design and electrical functioning that must be considered for a thorough understanding of the operation of the equipment.

The block diagram on the opposite page is intended to give an overall view of the functions of the various tubes in the equipment. The individual functions of the various sections and tubes are fairly obvious, but the circuits employed to obtain satisfactory operation at the frequencies employed are worthy of thorough consideration. In conjunction with the schematic diagrams shown with the text, frequent reference should be made to the complete schematic diagram given at the end of this section.

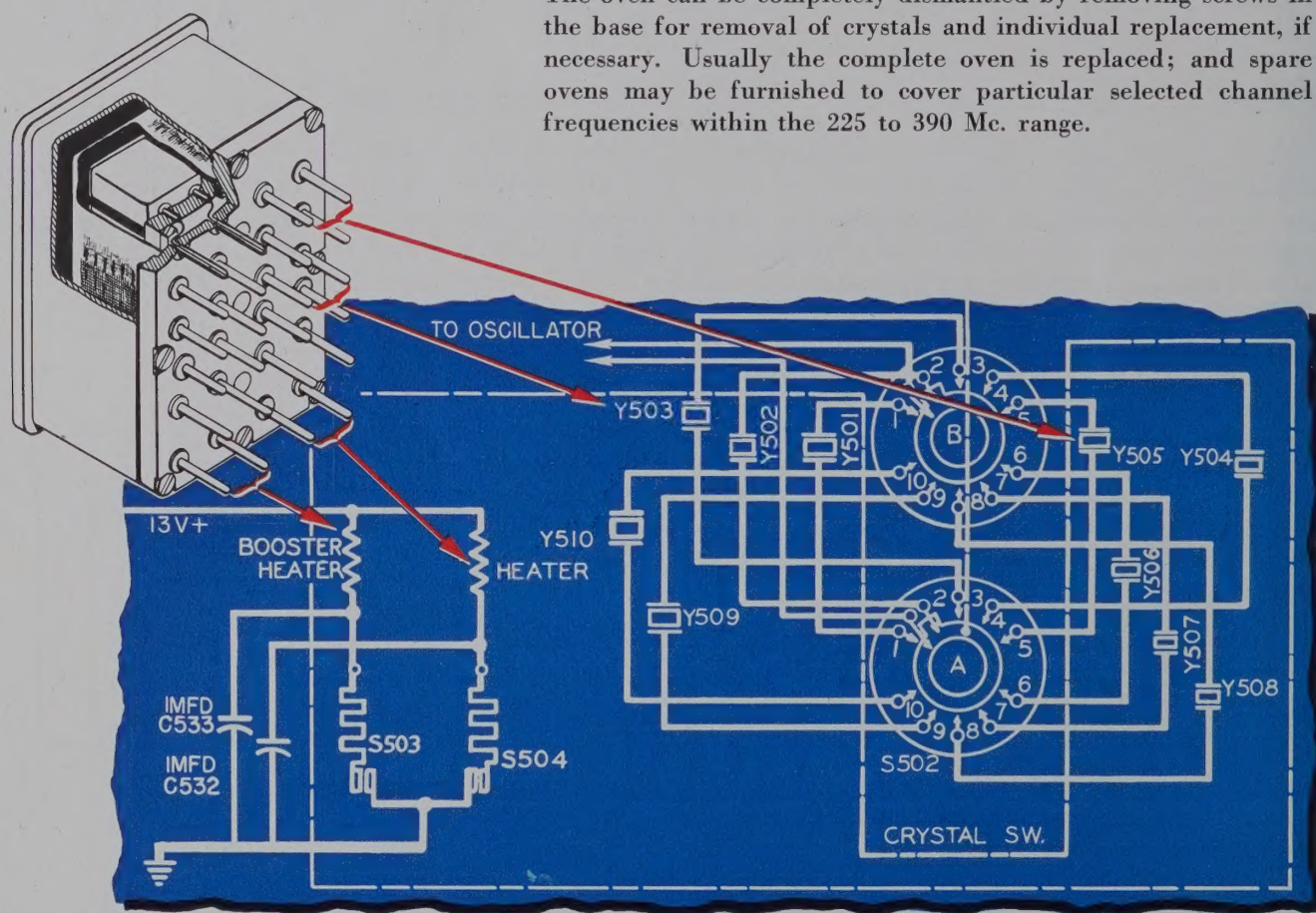
FREQUENCY DETERMINATION

The illustration below shows the details of the switching circuit employed to bring the proper crystal into the oscillator circuit for any given setting of the channel selector switch. A cutaway view of the crystal oven shows the connection of the crystal holders to the pins protruding from the base of the crystal oven.

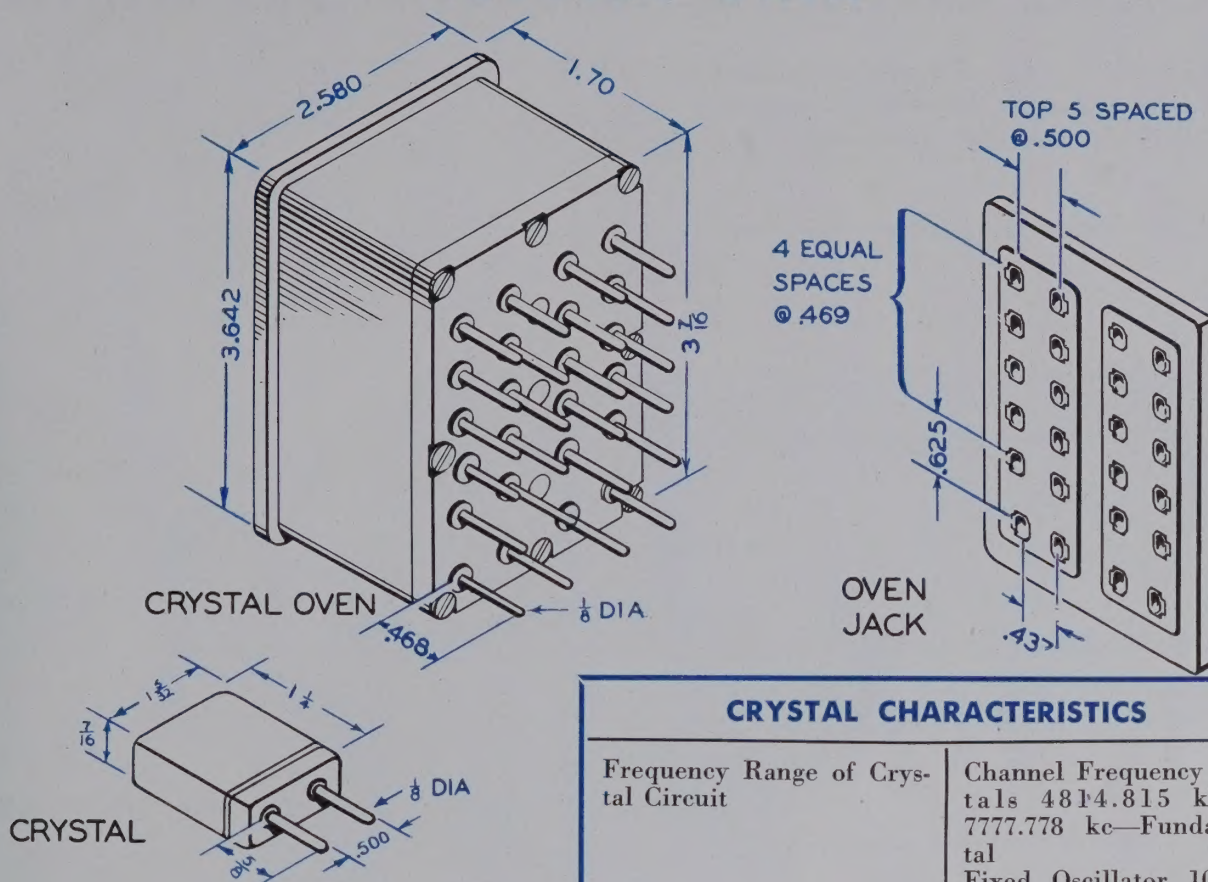
Ten pairs of the pins are used to make connection to the ten crystals in the oven. The other four pins serve as terminals for the two heating elements attached to the metal enclosure surrounding the crystal group. The temperature of the oven is controlled by two thermostats in the oven. The space between the metal case over the crystals and the outer case of the oven forms a dead air space to prevent rapid loss of heat from the oven.

The twin wafer switch S502 is mounted behind the jack plate in the transmitter-receiver panel into which the oven is plugged. These switches are driven by the tuning mechanism. The switch blades are rotated by the mechanism when a channel frequency change is being made. Thus, when a tuning cycle is completed, the switches will have brought into the circuit the correct crystal for the selected channel frequency.

The oven can be completely dismantled by removing screws in the base for removal of crystals and individual replacement, if necessary. Usually the complete oven is replaced; and spare ovens may be furnished to cover particular selected channel frequencies within the 225 to 390 Mc. range.

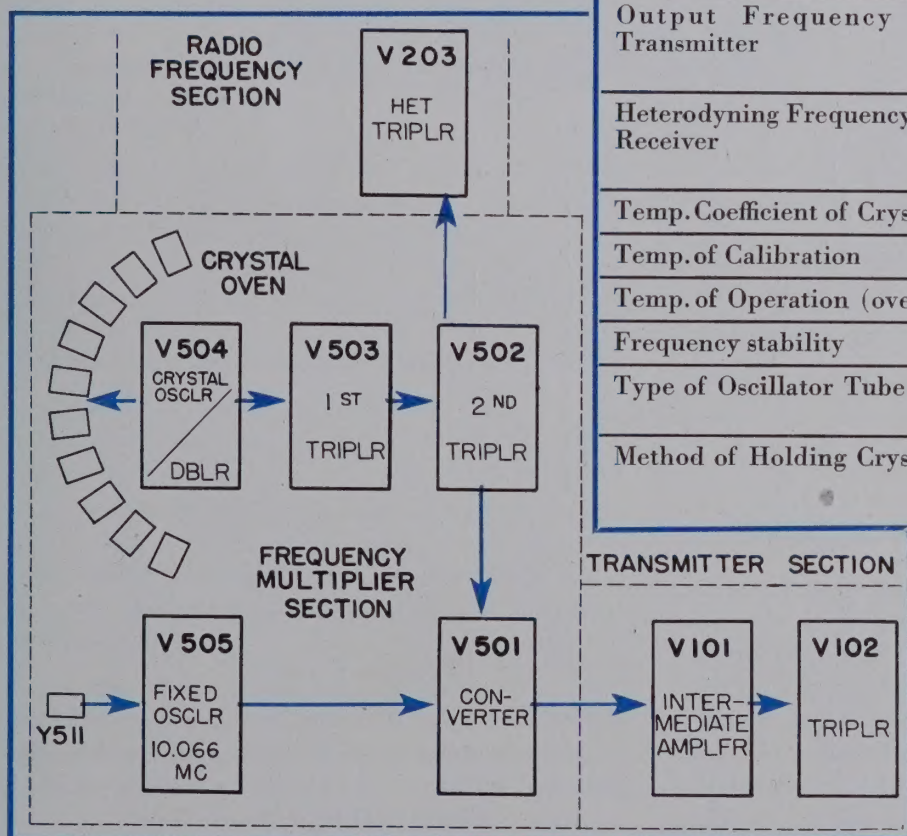


CRYSTAL DATA



CRYSTAL CHARACTERISTICS

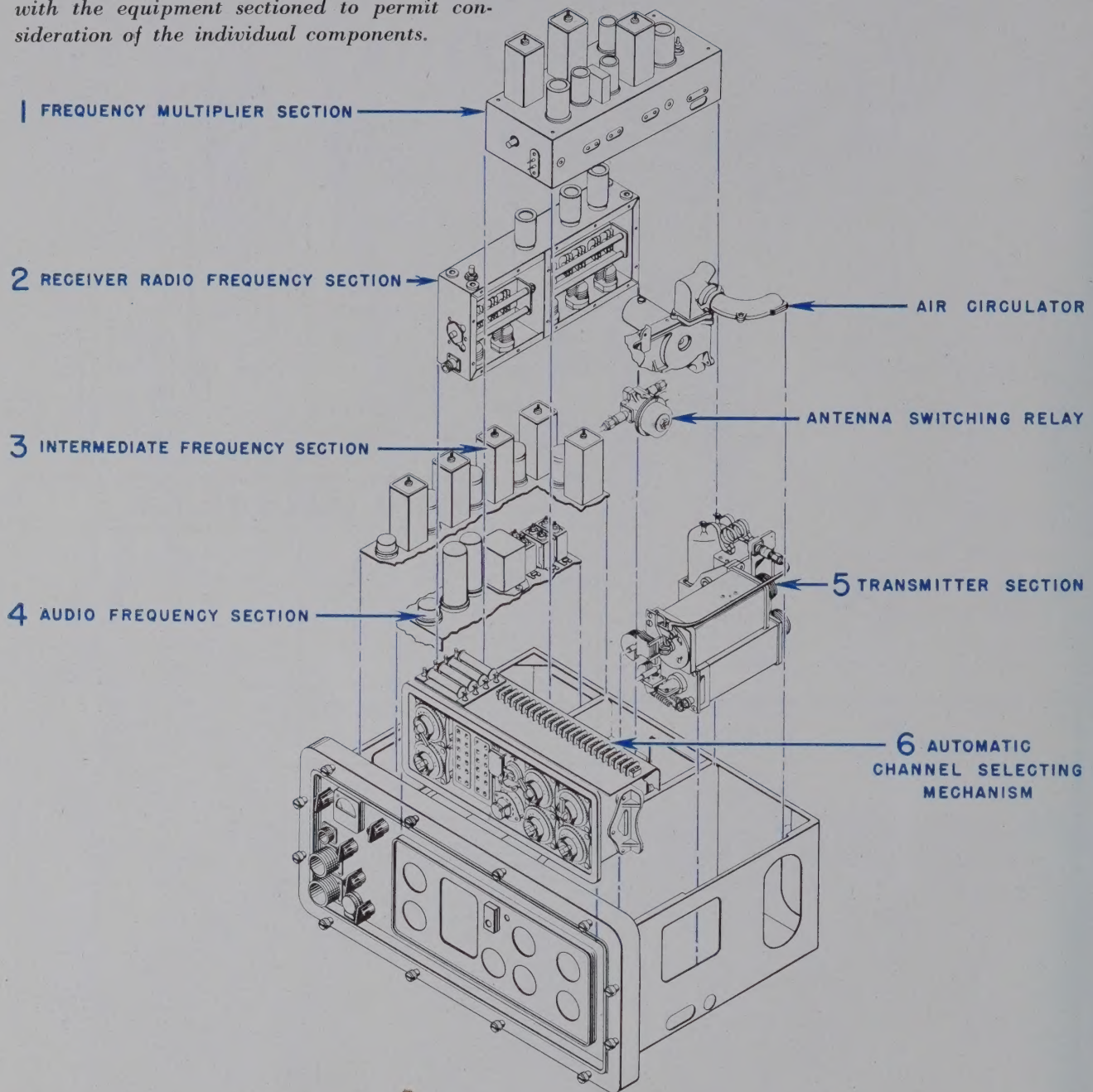
Frequency Range of Crystal Circuit	Channel Frequency Crystals 4814.815 kc to 7777.778 kc—Fundamental Fixed Oscillator 10066.7 kc—3rd Harmonic
Output Frequency of Transmitter	Crystal frequency doubled, tripled twice, heterodyned, and tripled.
Heterodyning Frequency in Receiver	Crystal frequency doubled, then tripled three times.
Temp. Coefficient of Crystal	50° C to 90° C—.007%
Temp. of Calibration	75° C
Temp. of Operation (oven)	75° C ± 3°
Frequency stability	.004%
Type of Oscillator Tube	Channel Frequency 6A67 Fixed Oscillator 604
Method of Holding Crystal	Plated Crystals, cemented to coil springs and sealed



The block diagram at the left illustrates the manner in which the frequency developed by each crystal in the oven is heterodyned by a fixed oscillator to provide two frequencies, differing by 30.2 megacycles for transmitter channel and receiver heterodyning frequencies.

FUNCTIONAL ANALYSIS OF TRANSMITTER AND RECEIVER

Cascade view of the Transmitter-Receiver chassis, with the equipment sectioned to permit consideration of the individual components.

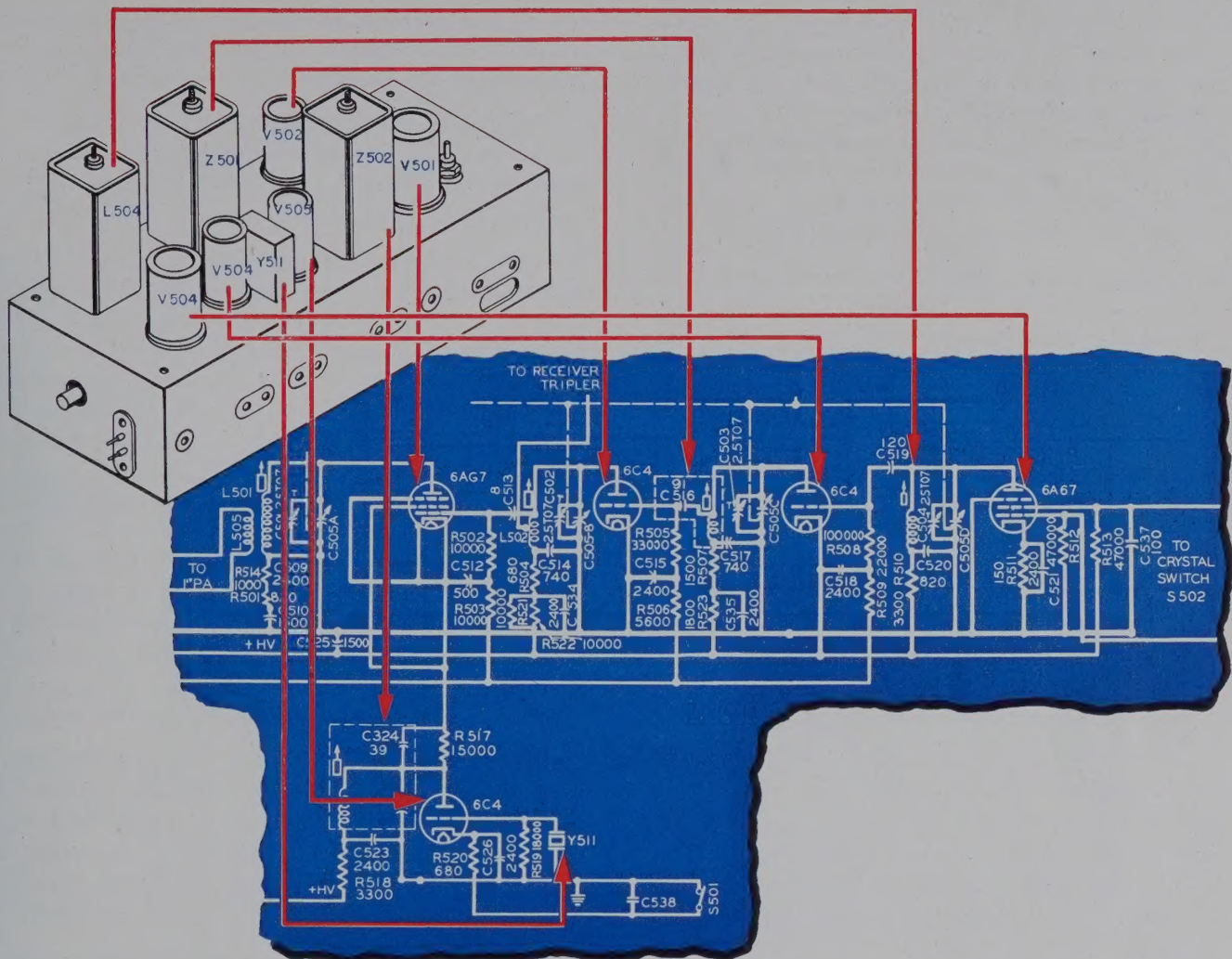


FREQUENCY MULTIPLIER SECTION

The function of the frequency multiplier is, as its name implies, to develop the necessary channel and heterodyning frequencies from the fundamental frequency of the crystals employed with the equipment. This method of developing extremely high frequencies is necessary because it is impossible to manufacture crystals with fundamental frequencies even approaching the 225 to 390 Mc.

range employed in the MAR equipment. The system of frequency multipliers used is shown in the illustration where the physical unit is associated with the partial schematic.

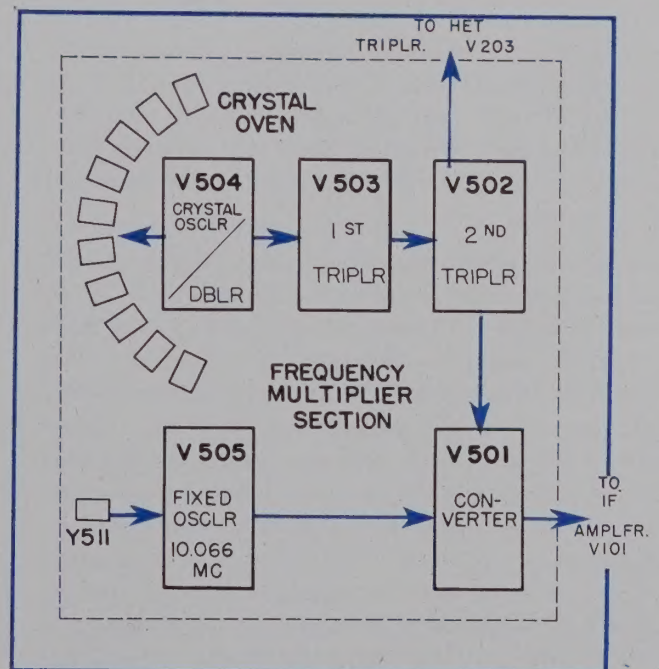
Referring to the illustration, the crystal selected by the switching mechanism is connected to the grid and screen of the oscillator section of V504 to form a Pierce oscillator.



The frequency generated in the oscillator section is the fundamental frequency of the crystal and through electronic coupling this frequency is impressed on the plate circuit of the same tube. The plate circuit is tuned to twice the frequency of the fundamental by L504 and C505D, with the result that the frequency is doubled in the plate circuit.

The output of V504 is coupled by means of the capacitor C519 to the grid of tube V503. This tube has its plate resonated by Z501 and C505C to three times the input frequency, hence a tripling action takes place to give an output frequency three times that of the input.

In turn, the output of V503 is coupled to the second tripler V502 through capacitor C516 where the tripling action is repeated by the plate circuit of V502 being properly tuned by L502 and C505B. The plate and grid circuits of both triplers are filtered by resistors and capacitors, as shown, to prevent intercoupling or feedback and self-oscillation.



At this point in the frequency multiplication it will be noted that a tap is taken on L502 in the plate circuit of V502. A portion of the output of the second tripler is thus diverted and coupled through capacitor C238 to a tripler tube in the RF section, to provide the heterodyning frequency for the receiver. The balance of the output from the second tripler V502 is fed to the grid of the converter tube V501 through capacitor C513.

A separate fixed oscillator will be noted at V505, which operates at a frequency of 10.066 megacycles, the third harmonic frequency of crystal Y511 in the grid circuit. The output from the plate circuit of the fixed oscillator is coupled into the screen grid of the converter tube V501 through capacitor-resistor combination R517-C522.

From the above it is evident that two frequencies are being fed into the converter tube V501, one from the second tripler V502 and the other from the fixed oscillator V505. The plate circuit of V501 will thus contain side-band frequencies equal to the sum and the difference of the two frequencies. Of these, the lower or difference frequency is selected by the plate tuning elements L501 and C505A.

By this procedure there is obtained a frequency for the transmitter that is 10.066 megacycles lower than the heterodyning frequency supplied to the receiver. Regardless of the frequency originally developed in the first oscillator, the two resultant frequencies will always differ by 10.066 mega-

cycles. By tripling in both receiver and transmitter, this difference is raised to 30.2 megacycles, which is the frequency to which the intermediate frequency amplifier in the receiver is tuned.

The output of the converter tube V501 is coupled to the input of the transmitter amplifier by an untuned link circuit, comprising L505 inductively coupled to L501 and leads to L101.

There will be noted a Frequency test switch S501 in series with the cathode bias lead, which on being opened renders the 10.066 megacycle oscillator inoperative. The switch takes the form of a push-button mounted on the selector panel to the right of the pilot light and is used to check the frequency output of the converter tube. Under some conditions it is possible to tune the input circuit of the IPA, V101, to the carrier frequency instead of the side-band frequency from the converter tube, resulting in a reduced output from the IPA tube at an improper frequency. When the 1st IPA stage is improperly tuned, cutting off the fixed oscillator by means of the switch allows it to continue operating. When tuned correctly, the 1st IPA stage becomes inoperative when the switch is opened.

The four tuned circuits in the frequency multiplier are simultaneously tuned by the Multiplier selector dial on the panel. The circuits are aligned to assure proper tracking at all frequencies by adjustable cores in the shielded tuning inductances and padding capacitors across the variable capacitors.

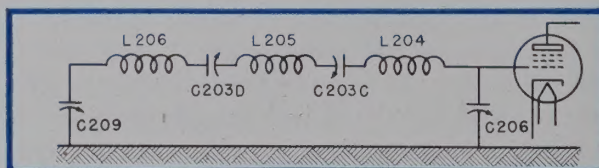
RECEIVER RADIO FREQUENCY SECTION

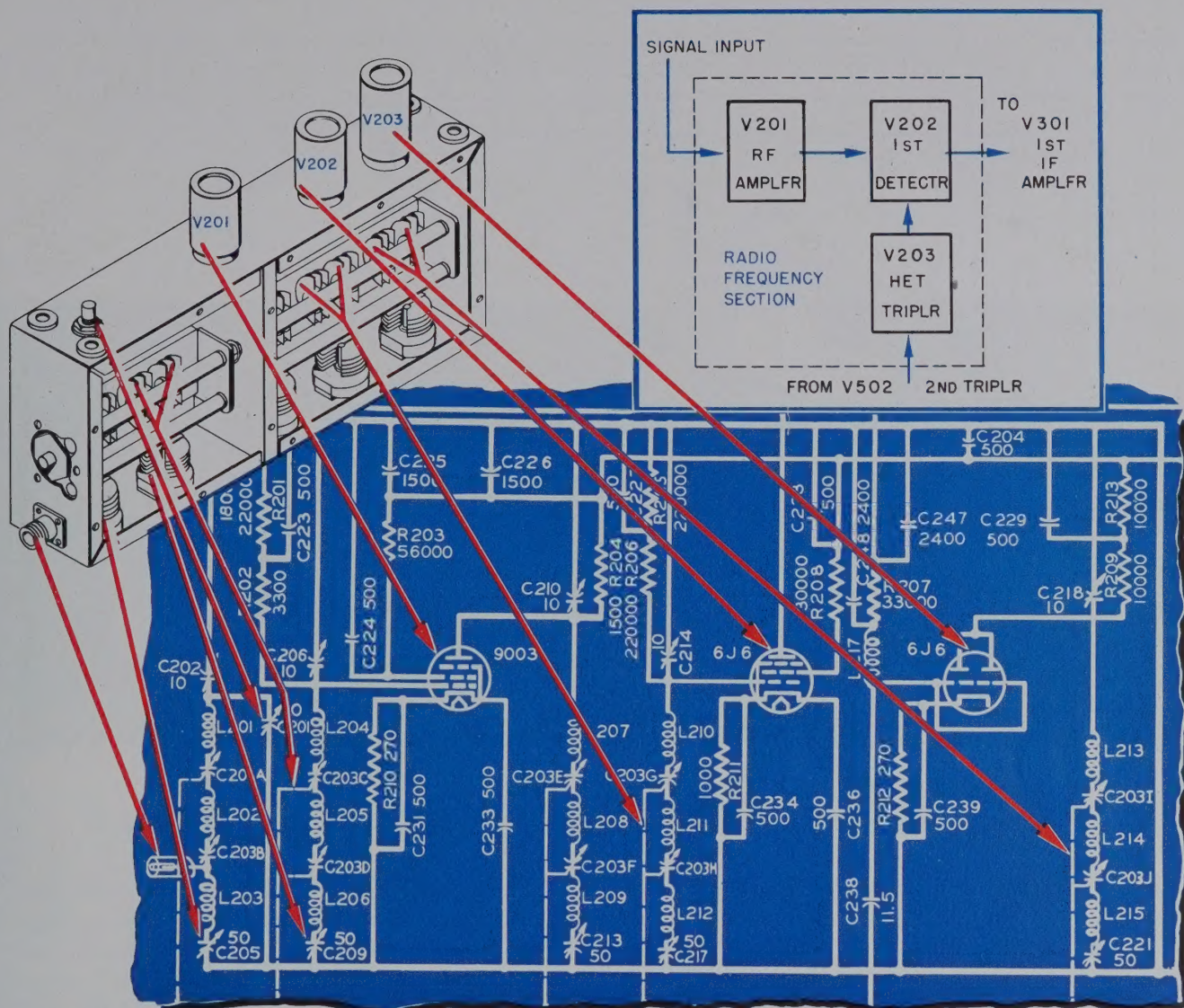
The radio frequency tuning section of the receiver employs five resonant circuits, simultaneously tuned by the RF dial on the selector panel. Four of the circuits are utilized to tune the channel frequency being received, the fifth resonating the output of the heterodyning tripler tube included in this unit.

As shown in the illustration of a portion of the schematic and a simplified schematic, the tuned circuits consist of three inductances in series, with variable capacitors between the sections. Two tuned circuits precede the RF amplifier tube V201. The input from the antenna is tapped into inductance L203 to provide sufficient input into the first tuned circuit without excessive loading that might affect the tracking of this circuit when tuned to different frequencies. To neutralize any such effects, a compensating capacitor is connected as shown at C201 and is individually controlled by a knob on the panel through a system of geared shafts.

The first tuned circuit is coupled inductively to the tuned grid circuit of the RF tube, partial electrostatic shielding being employed to provide uniform coupling throughout the frequency range. Adjustment of the coupling is made in assembly of the equipment and allows for good energy transfer with high selectivity.

The tuning circuits employed for all the tubes in this section may be best explained by a consideration of the simplified schematic on this page. The frequencies employed in the receiver are in the ultra-high-frequency range and the use of lumped capacities and inductances is impractical, for the leads represent appreciable inductance value.





As an example, refer to the simplified schematic as representative of the input circuit to the RF tube. The inductance L204 is of such a value that when the capacitors C203C and C203D are at minimum settings, a resonant half-wave line is formed, with respect to the ground, for the frequencies at the high end of the tuning band. The inductance L205 and L206 have electrical lengths of less than one half and one quarter wavelength respectively, in order to avoid resonance in the tuning band.

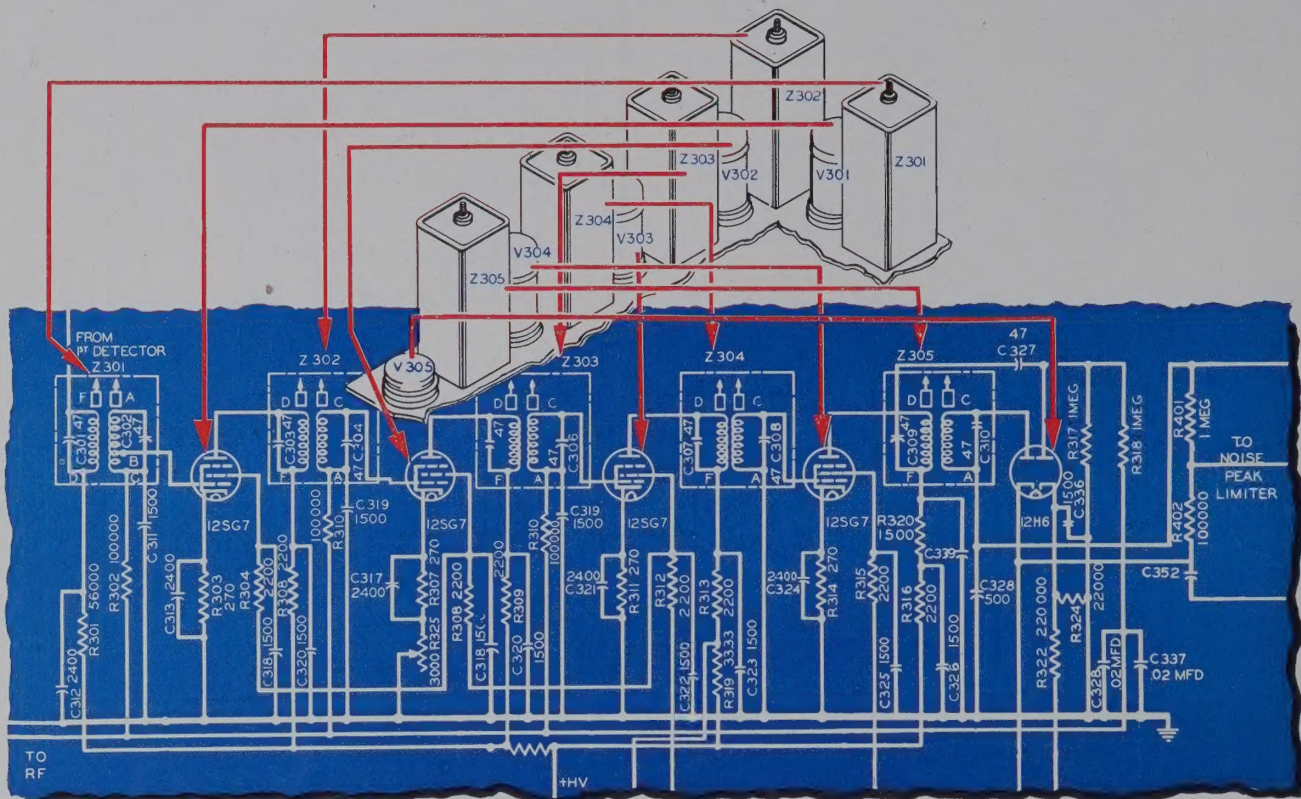
As the capacitors C203C and C203D are increased in value, the additional inductances L205 and L206 are gradually introduced into the line. This has the effect of electrically lengthening the line and making it resonant to lower frequencies. Alignment is obtained by adjustment of trimming capacitors, C206 in the circuit shown, which is connected to L204 at the point of current maximum for the high frequency end of the band. An additional trimmer, C209 for the circuit under discussion is provided for service alignment at the

point between middle and high end of band.

Returning to the consideration of the operation of the receiver RF section as a whole, will be noted that the output or plate circuit of the RF amplifier is tuned and also coupled inductively to the input circuit of the 1st detector V202.

A portion of the output of the second tripler in the frequency multiplier section is fed to V203 in the RF section. An inductance L217, connected to the grids of the V202 tube, and the coupling capacitor C238 form a filter that assures uniform coupling to the tripler at all frequencies.

The plate circuit of this heterodyning tripler tube is resonated in the same manner as that employed with the RF tuning circuits and is inductively coupled into the grid circuit of the 1st detector. A heterodyning action is thus obtained that results in an intermediate frequency of 30.2 megacycles for amplification in the intermediate frequency amplifier.

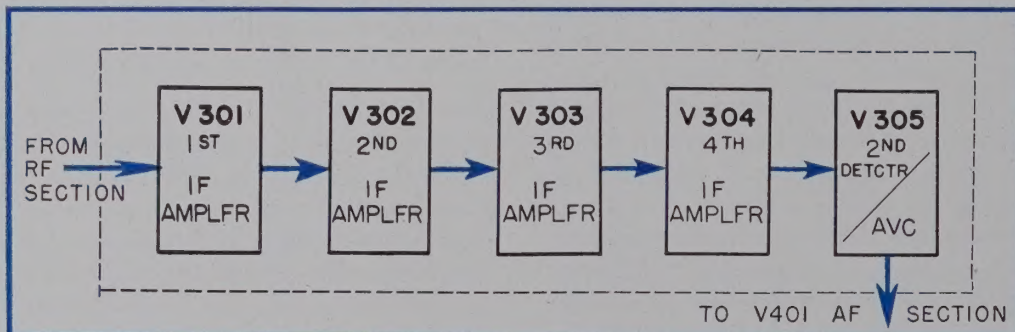


INTERMEDIATE FREQUENCY SECTION

The intermediate frequency amplifier consists of four stages of amplification employing fixed tuned transformers Z301, Z302, Z303, and Z304 as coupling between the associated tubes V301, V302, V303, and V304. The transformers are wound with their coupling a little greater than critical to broaden the top of the resonance curve, partially tuned by fixed capacitors connected across the winding, with final alignment being made possible by adjustable cores.

The plate output of the 1st detector is connected directly to the primary of the first intermediate transformer Z301, the secondary being tapped for the input to the first intermediate amplifier tube to

obtain better overall stability of the amplifier. The three following stages are identical, particular care having been taken to stabilize the circuits by the use of resistance-capacity filters in the current supply circuits and the use of chokes in the filament circuits. The screen grid potentials of the first three tubes, V301, V302, V303, are drawn through resistors in series, with by-pass condensers at points of connection. This method of filtering avoids overall feedback. A variable resistor shown at R325 in the cathode return of the second tube permits the adjustment of the amplifier during assembly and alignment to compensate for differences in the gain of the amplifier due to manufacturing tolerances in the equipment and tubes.



The last tube V305 in the section is a double diode. One section is utilized as the 2nd detector, the other functions to provide automatic volume control. The detector section is connected to the secondary of the last intermediate frequency transformer Z305, the rectified audio frequency potentials appearing across the plate-load resistors R401 and R402. The audio frequency potentials across R401 are then fed to the noise-peak limiting tube in the audio frequency amplifier section and thence to the audio amplifiers.

The right-hand section of V305 is the automatic volume control rectifier that furnishes bias voltage to the grids of the tubes to control the gain of the intermediate and radio frequency amplifier stages. Signal input to the AVC section is through capacitor C327 from the plate circuit of the last intermediate frequency amplifier tube.

A delay in the action of the AVC circuit is obtained by biasing the cathode of the rectifier positive by the voltage drop across resistor R324, which is connected in series with the rectifier load resistor R317.

The positive bias is sufficiently great to prevent

conduction through the rectifier at signal intensities up to approximately 75 percent of the maximum power capabilities of the amplifier. Beyond this point the signal input to the AVC section becomes great enough to override the positive bias and the tube conducts current. This current flow results in a potential appearing across R317.

The negative end of the load resistor is connected through R318 to increase the bias voltage applied to the grids of the RF amplifier tube V201 and the first three stages of the intermediate frequency amplifier to reduce their gain.

The circuit values are so proportioned that further increases in signal intensity result in the delivery of increasingly greater biasing voltages to the grids so that the gain falls off more rapidly. This results in a relatively constant audio output level for wide variations of input. The rapidity of response of the AVC is determined largely by the time constant of the R-C network formed by resistors and capacitors R317, R318, C328, and C337. The time constant is made as small as possible without introducing distortion at low modulation frequencies.

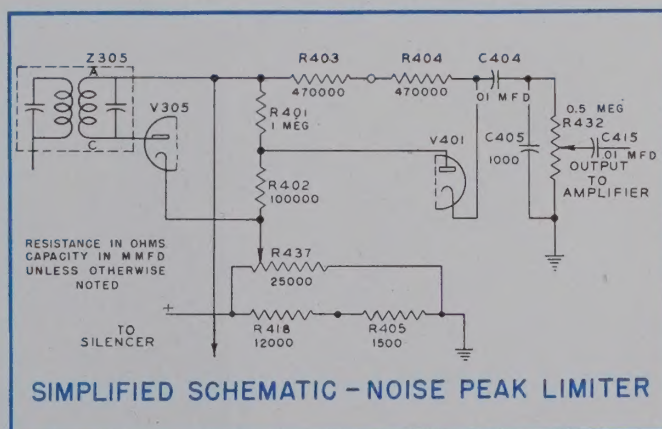
AUDIO FREQUENCY AMPLIFIER SECTION



In addition to providing the two desired stages of audio frequency amplification, this section includes a noise peak limiter, meter rectifier, and silencer circuit. All these functions are performed by the three tubes shown in the illustration tied to the schematic to identify the parts and their connections. The left hand section of the V401 tube is the meter rectifier, used with the meter on the panel.

NOISE PEAK LIMITER—The other diode in the V401 is used as a noise peak limiter and its functioning may be better understood from the simplified schematic given herewith. The 2nd detector V305 and its load resistors R401 and R402 are shown in this connection to aid the explanation.

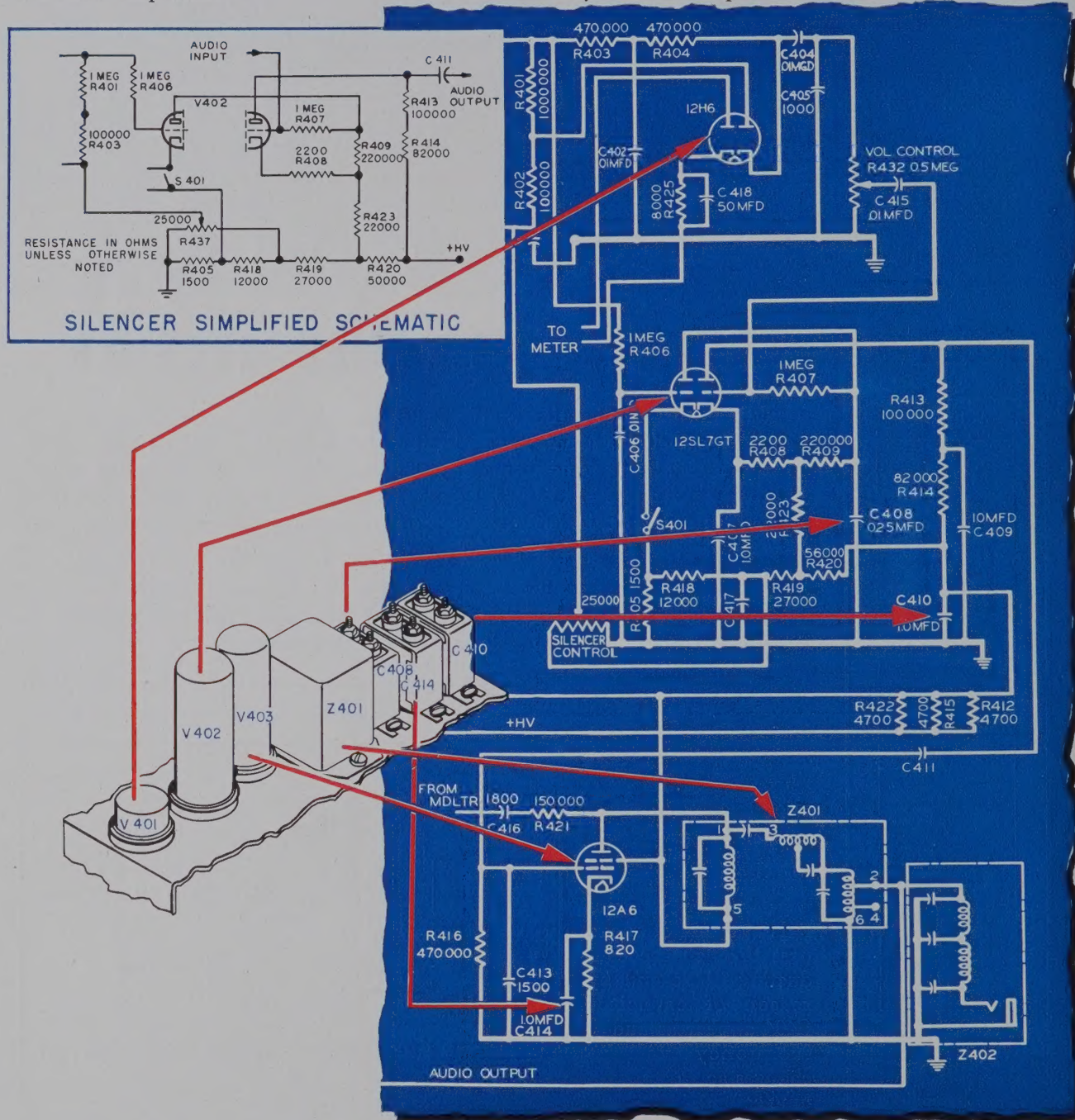
The audio output of the 2nd detector is developed across the load resistors R401 and R402, as previously mentioned. The plate of the limiter section is biased positive by potential developed across R401 when a signal is applied to the 2nd detector, V305, and is thus made conducting. Under this condition the negative audio potentials at the midtap can pass through the conducting diode and by reason of capacitor C404 appear as audio-frequency voltage changes across the volume control R432.



This condition exists as long as normal signal levels prevail but a high level noise impulse will result in a high negative potential appearing at the midtap of the detector load resistors, thus rendering the plate of the diode negative with respect to its cathode and the tube non-conducting. The cathode is held at its normal potential by virtue of the time constant of the R-C network R403 and C402. This cuts off all signal impulses to the output with the result the noise peak is barred from the amplifiers. On cessation of the noise impulse, the circuits return to their previous condition and the normal signals may pass through the tube to the audio amplifiers.

Output to the audio amplifiers is controlled by the setting of the output level control R432 which determines the output of the receiver. A capacitor C405 connected across the output level control potentiometer is intended to bypass the higher frequency audio currents to reduce hiss in the output.

SILENCER—The second tube, V402, in the audio amplifier section is a double triode and functions both as silencer amplifier and 1st audio amplifier. The output of the noise-peak limiter V401 is coupled to the grid of the right-hand section of V402 by means of capacitor C415, as shown in the sim-



plified schematic, which, for ease of explanation, also includes the detector plate load resistors R401 and R402.

Plate current to the audio amplifier section of V402 flows through R413 and R414, which act as the plate load for the tube. Variations of plate current appear as voltage changes across these resistors. These potentials are coupled through C411 to the output stage V403.

Normal grid bias for the audio amplifier is obtained from R408, connecting through R423 to the voltage dropping resistors shown. However, R409 is included in the grid circuit of the audio amplifier and in the plate circuit of the left-hand or silencer amplifying section of the tube.

SILENCER AMPLIFIER

The silencer amplifier grid is connected across the output of the second detector as shown. The grid of the silencer amplifier is biased positive by the variable resistor R437, permits current to flow in the plate circuit. This results in a voltage appearing across R409 that biases the audio amplifier grid beyond the cutoff point and renders the tube inoperative. Thus no sound is heard in the output of the receiver.

Should a signal of sufficient intensity reach the output of the detector to override the positive bias on the grid of the silencer amplifier, the grid would become negative; cutting off the plate current. With the reduction of plate current, the biasing voltage across R409 would decrease, allowing the audio amplifier to function normally and pass the signals. When the signals ceased, the silencer amplifier grid would become positive, allow the plate current to flow again, biasing the audio amplifier to the cutoff point and rendering the receiver silent between signals.

SILENCE LEVEL CONTROL

The Silence control setting on the panel determines the point at which signals can pass through; hence the control should not be set higher than will permit the weakest signal to be received to override the positive bias on the amplifier and be heard. A switch S401 is provided on the panel to render the circuit inactive. No plate current can flow in the silencer amplifier section when this switch is opened.

AUDIO OUTPUT—The output of the first audio amplifier stage in V402 is coupled by capacitor C411 into the grid circuit of the audio output stage V403. A capacitor C413 is connected across the input to this tube to reduce further the higher frequency components of the audio currents.

A filter and coupling network Z401 is connected into the plate circuit of the output tube. From the impedance in the plate of the tube, the audio output is coupled to the audio-frequency band pass filter in the network in Z401. This network passes frequencies between 300 and 3000 cycles to an RF filter Z402 and thence to the local headset jack associated with the filter. The RF filter is used to prevent radio-frequency currents picked up by the headset cord from entering the equipment at this point and setting up disturbances in the receiver circuits.

The output of the audio filter in the last audio stage is also connected, through the cable between Transmitter-Receiver and the Modulator-Dynamotor units, to the headset jack on the panel of the latter unit. Capacitors C721 and C730 in this unit pass the audio-frequency output to the Line terminals through contacts on relay K701 and RF filter Z704 so the receiver output may be heard at the remote control box.

By means of the IC-Phone switch on the modulator-dynamotor panel, the output of the secondary of the modulation transformer T702 is connected to the audio output network Z401 through C416 and R421. This permits communicating with the operator at the remote control box without resultant radio transmission, since modulating current is cut off from the transmitter section.



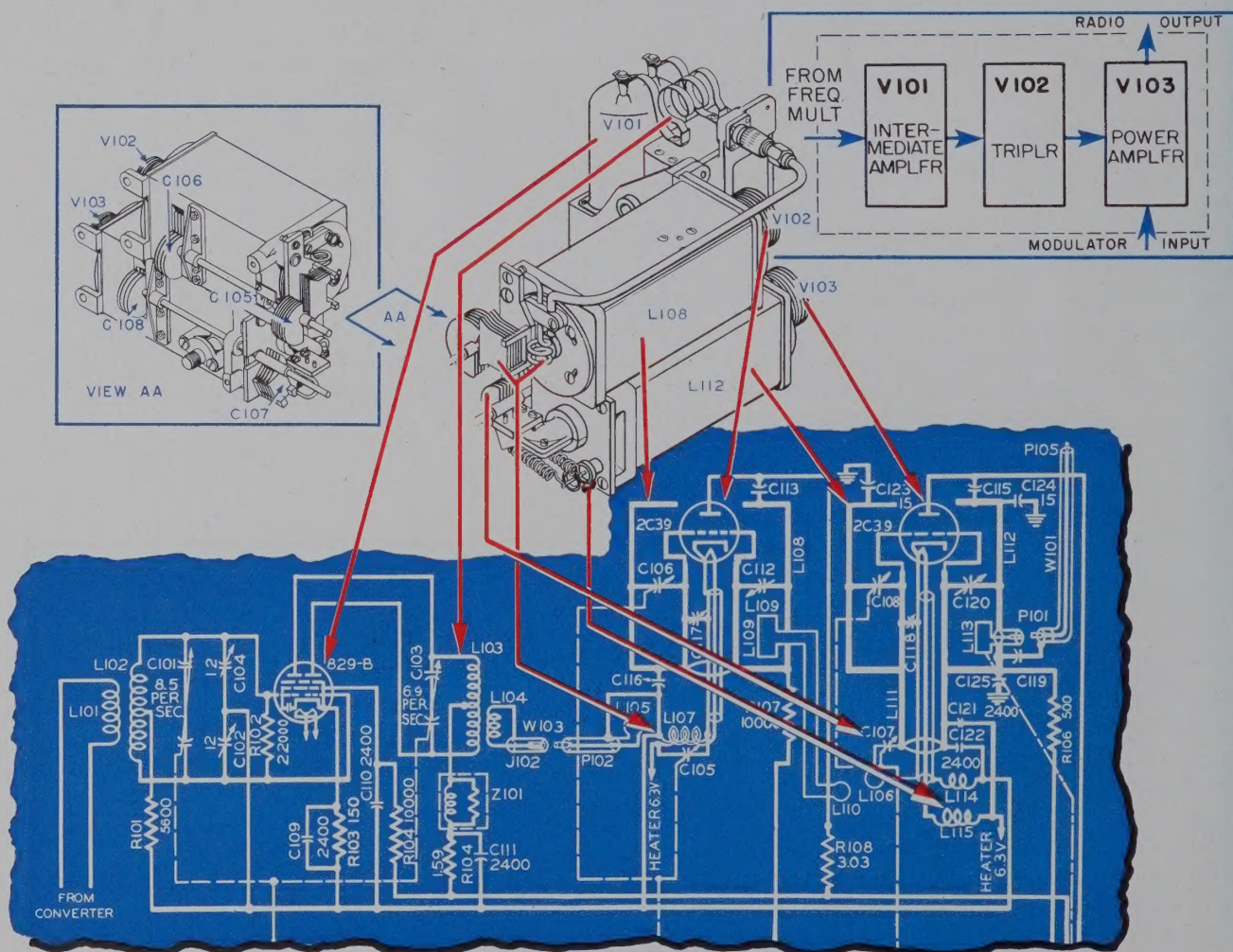
TRANSMITTER SECTION

The illustrations show the schematic diagram for this section associated with an illustration of the physical equipment and a block diagram. As shown in the circuit diagram given, the output of the converter tube in the Frequency Multiplier section is coupled by means of the inductance L101 to the input of the 1st Power Amplifier V101. The frequency, as may be recalled, is 10.066 megacycles below the frequency fed to the receiver RF section.

INTERMEDIATE AMPLIFIER—The 1st PA tube, V101, is connected in a conventional push-pull circuit, with low bias and high power gain, the frequency remaining the same in the output. Both input and output circuits of the tube are tuned by variable capacitors C101 and C103 controlled by the 1st IPA selector dial on the tuning panel, with associated inductances L102 and L103.

The output of the 1st IPA is coupled to the input of the frequency tripling stage V102 by means of two loops, L104, L105, and a coaxial line, with the outside conductor grounded. Since the frequency is tripled in this tube, special arrangements must be made to obtain circuit resonance at the very high frequencies now involved.

TRIPLER—The tube itself, a 2C39, known as a "lighthouse" tube, is fitted into a hollow metal case with a center conductor, which forms the resonant grid-plate circuit, a capacitively shortened quarter-wave line, shown in heavy lines in the schematic diagram and indicated at L108. The outside of the resonant tank circuit formed by the case and the inner conductor are at R-F ground potential. The tube plate is connected to ground for R-F through C113 to the outside of the case.



The grid is connected to the free end of the center conductor, which point is at high R-F potential with respect to the plate. This circuit is tuned by the end loading capacitor C106. The grid is a plane between plate and cathode on the 2C39. It covers the end of the hollow center conductor, effectively shielding the grid-cathode circuit from the grid-plate circuit. The heater and cathode are connected by a coaxial line to an input tank circuit L107-C105 the heater wire being brought out concentrically through the cathode line and coil.

Tuning capacitors C106 and C105 are ganged together and adjusted by 2nd IPA selector dial on the panel. Two trimming condensers are shown at C112 and C117. These are used to compensate for any changes in interelectrode capacity encountered in changing tubes.

The tube in this circuit functions in the following manner. With the cathode biased 5V positive with respect to the grounded grid, the plate current flow to the cathode is practically cut off. When current of the proper frequency is coupled into L107, the cathode swings positive and negative with respect to the grid.

With the cathode positive (the grid negative) there is no current flow through the tube. When the cathode swings negative, the positive potential on the grid, of some 100 volts, is in series with the positive potential between plate and grid.

A pulse of both plate and grid current then surges into the resonant plate-grid circuit to set up oscillations. The plate-grid tank is tuned to a frequency three times that of the input circuit. The plate-grid circuit is kept in oscillation by receiving a pulse of current every third oscillation. By thus applying the grid excitation potentials in series with the plate voltage, high plate efficiency is obtained from the tube.

In resonant circuits of this type there are no RF potentials on the outside of the tank assembly. All currents present flow on the interior surfaces of the circuit, and the resultant electromagnetic field exists only in the space between inner and outer conductors.

For the above reason the coupling between the tripler, which in this case acts as a driver, and the PA tube is by means of a single loop L109 located in the space between the conducting surfaces forming the resonant plate-grid circuit, a short open line and a second loop L110. The latter inductively couples to L106 in the input of the Power Amplifier V103.

POWER AMPLIFIER—The plate-grid circuit of the Power Amplifier is identical with that employed in the Tripler. A variable capacitor C108 is used to resonate the circuit with a trimmer capacitor C120 arranged to compensate for variations of plate-to-grid capacity, met with in replacing tubes.

The input circuit is as shown in the schematic, and differs considerably from that of the tripler. The input must operate at channel frequencies and is built in the form of a half-wave resonant line by utilizing the outer conductor of the cathode-heater leads and the extended inner conductor of the plate-grid assembly. A series L-C circuit formed by L106 and C107 is connected across the open end of the line for tuning. Both input and plate-grid circuits are tuned simultaneously by the PA selector dial on the panel. The heater of the tube is fed through chokes L114 and L115 to isolate the dc input from the RF point of the circuit to which the dc input is connected.

The functioning of the tube is similar to that of the tripler. The tuning phenomenon in the input is of interest. With the series variable capacitor C107 at minimum, the resonant input line is functioning as a half-wave line and resonates at the higher frequencies. As capacitor C107 increases in value, the series circuit consisting of C107 and L106 approaches series resonance and, at maximum setting, the resonant line is effectively shorted down to a quarter-wave line loaded by tube and stray capacities. The input is then resonant to the low frequency end of the tuning band.

The action within the tube itself is similar in all respects to that in the tripler. The grid remains at ground potential and, when the cathode swings negative with respect to the grid, both grid and plate furnish current momentarily to the resonant plate-grid tank to maintain oscillations.

A single loop inductor L113 arranged within the plate-grid tank assembly serves to pick up the energy in the plate-grid tank and feed it to the transmission line and antenna. This loop is mounted on a pivot and is adjusted by the Ant. selector dial so that the degree of coupling to the plate-grid circuit can be varied. This permits adjustment of the load on the tube output to obtain rated output power under varying conditions of load.

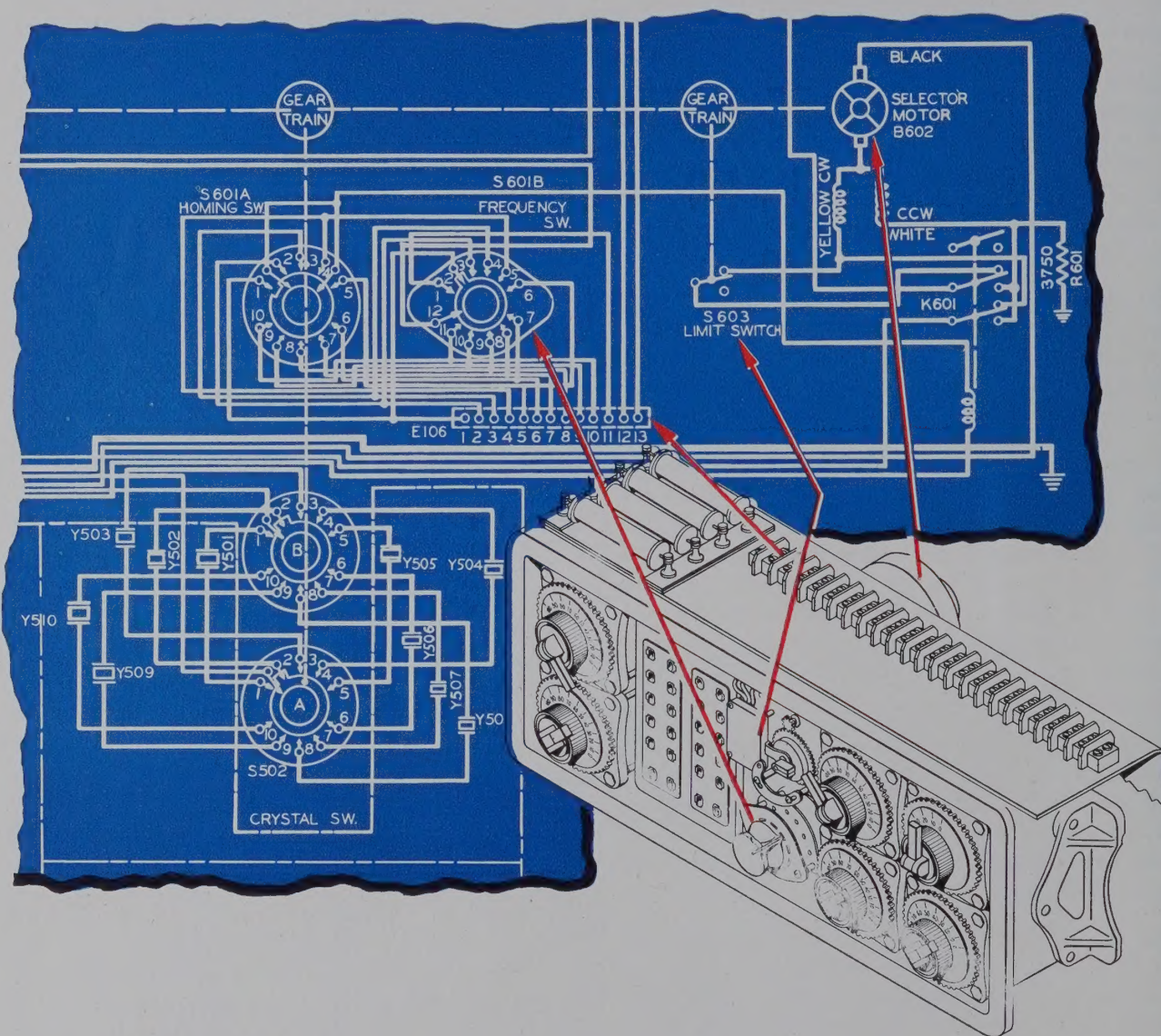
Proper settings are made while tuning the equipment to prevent overloading of the power amplifier.

AUTOMATIC CHANNEL SELECTING MECHANISM

Built into the panel at the right of the Transmitter-Receiver is the mechanical system for automatically tuning the equipment to any frequency selected by the Channel Selector switch. The four selectors grouped at the right of the panel are for transmitter tuning. The two at left are, respectively, for the receiver and for the multiplier section common to both transmitter and receiver circuits. The center of the assembly mounts the jack plate for the Crystal Oven and the switches that control the functioning of this unit.

The electrical components of the assembly are shown in the schematic diagram in the illustration and are associated with the respective physical parts of the equipment.

The twin wafer Crystal Switch S502 is mounted behind the jack panel. It was described in detail in connection with the crystal oven. Note here that it is coupled to the same shaft that drives the Homing Switch S601A. The latter is a closed circuit switch, in that the rotating member makes contact with all stationary contacts but one.



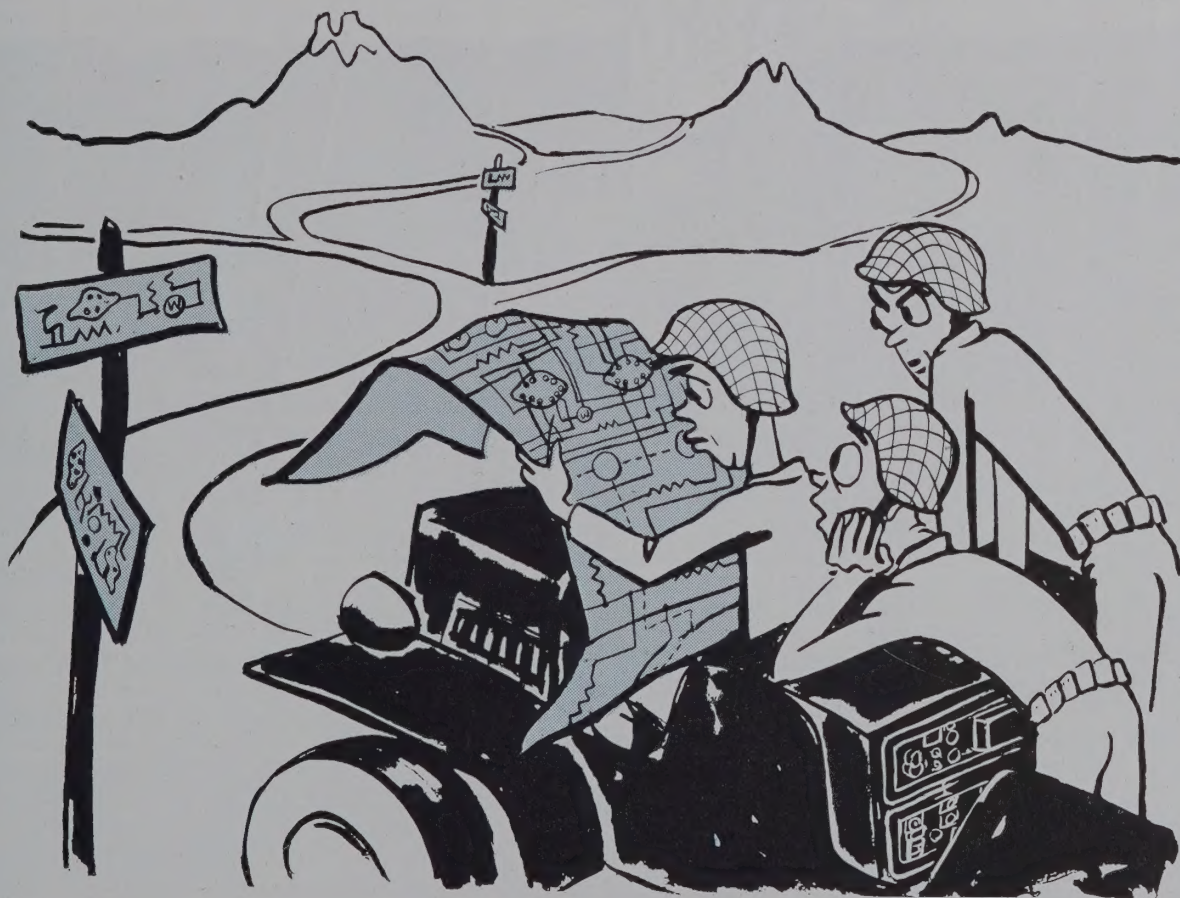
The Frequency Switch 601B is manually operated by a knob on the panel and has 11 stationary contacts, of which the moving arm contacts one at a time. Ten of the contacts are for frequency selection. The extra contact is to transfer control of the equipment to any remotely mounted switch of a similar type that can be connected to the terminal board provided for this purpose.

The operation of the mechanism is as follows: When the Selector Switch is moved to any given contact, a circuit is closed through the Homing Switch contacts to the windings of relay K601. The relay closes, operating two sets of contacts. One set of contacts closes the circuit to a relay K702 in the Modulator-Dynamotor unit to regulate the voltage to the motor on direct current. When operating on a-c from the Universal Power supply, relay K702 does not function. The other set of contacts closes the circuit through one field winding of the motor to drive the selector mechanism.

As the selectors rotate, the Crystal Switch and

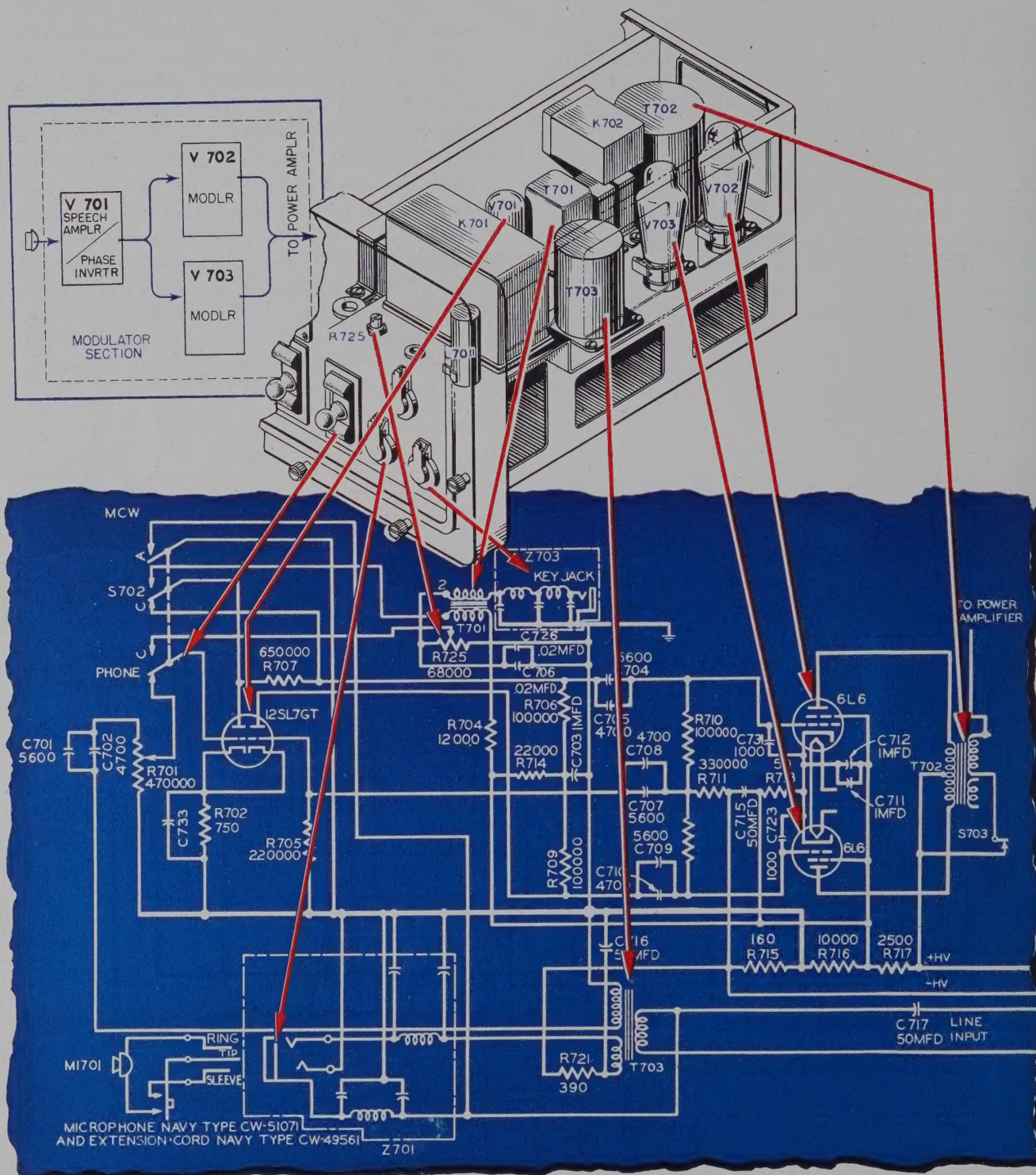
Homing Switch are rotated till the Homing Switch reaches a point corresponding to the setting of the selector switch. The circuit to K601 will then be opened, and the dropping out of the relay closes a circuit through the other field of winding to reverse the motor.

When running in the forward direction, the motor drives an outer drum on each of the selector mechanisms. Each drum has ten slots, each slot corresponding to one of the ten positions of the Selector switch. Thus the slot which corresponds to the position selected will stop in the proper location. At this position, a pawl will be cocked. When the motor reverses it carries the shaft of the tuning capacitor or other device around with it. In the selector, a disc with a notch is also carried around with the capacitor. When the notch comes under the pawl, the pawl drops and stops the shaft. A slipping clutch arrangement permits the switches and selectors to retain this position while the motor runs reverse till a cam on one shaft strikes and operates the limit switch, cutting off the motor.



MODULATOR CIRCUITS

The speech amplifier for modulating the output of the transmitter is assembled in the Modulator-Dynamotor unit, which includes the dynamotor for generating the high voltage plate current.

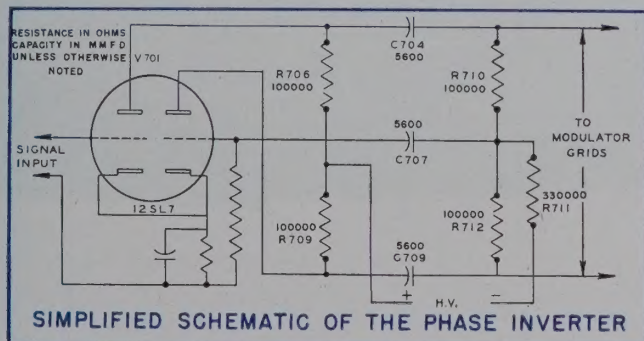


The illustration shows the equipment and schematic diagram of the apparatus involved in modulation of the carrier wave of the transmitter. The circuit is rather complicated, in that it involves numerous switches and relays to perform the varied functions required. Basically the circuit consists of a speech amplifier tube V701 driving a pair of modulator tubes V702 and V703 to furnish potentials to plate-modulate the transmitter.

The normal speech input for phone transmission to the speech amplifier tube V701 is from the secondary of the input transformer T703. This transformer has two primary windings; one winding of low impedance is to match the microphone plugged into the local jack associated with the filter assembly Z701, the other primary is of high impedance to match the output of the microphone transformer in the remote box. The input to the tube is adjustable to meet average conditions by means of variable resistor R701 mounted on the chassis in the equipment.

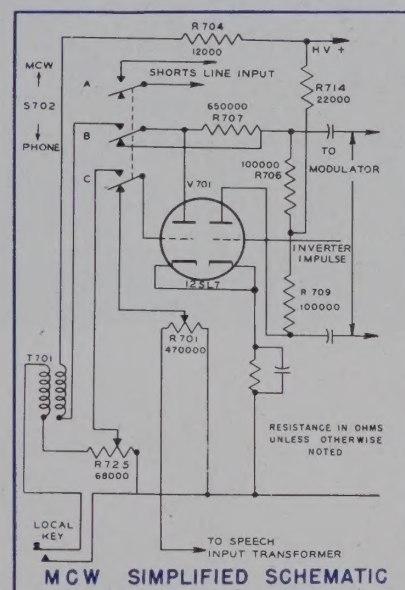
The speech amplifier tube is a double triode and is connected into a phase inverter circuit, which means simply that one triode section amplifies the voice impulses directly but is connected to operate the second triode so that its output will be 180° out of phase with the first. Thus, with the usual amplifier input, it is possible to obtain an output equivalent to that of a push-pull stage.

The simplified schematic shown herewith will aid in understanding this action. The signal input is amplified in the left-hand section of the tube V701, which has a resistor R706 in the plate circuit, the signal being coupled through capacitor C704 to the grid of one of the modulator tubes, V702. The voltage variations impressed on the grid of the modulator will appear across grid resistor R710 and resistor R711. The potential at the midpoint of these resistors will be fed back through capacitors C707 and C708 to the grid of the right-hand section of V701 to be amplified in this section and coupled by means of resistor R709 and capacitor C710 to the grid of the other modulator tube V703.



The output of the two modulator tubes V702 and V703 is coupled, by means of the modulation transformer T702, into the plate circuit of the Power Amplifier to produce modulation up to 100% of the carrier wave.

For MCW transmission, a switching system is employed to convert the input section of V701 into an audio oscillator to provide a 1200-cycle note that is fed to the modulating tubes. A simplified schematic diagram is shown below to illustrate the method employed. When the MCW-Phone switch S702 is in the phone position as shown, the grid of the speech amplifier is connected to the speech input circuit from transformer T703 through contacts C. Resistor R707, in the plate circuit, is shorted by contacts at B. Moving the switch S to the MCW position, causes contacts C to connect the grid of the tube to the arm of the variable resistor R725 in the secondary circuit of transformer T701. A key jack in the modulator panel provides for connecting a key in series with the transformer winding to interrupt its output for signaling purposes.



The plate of the tube is parallel connected to the primary of the transformer by contacts B which also removes the short from R707. The transformer causes the plate circuit to feed back into the grid to set up 1200-cycle oscillations when the key is closed. Contacts A on the switch short the line input, to operate the relay K701, placing the equipment in transmitting condition. The input of the modulating note to the speech amplifier is adjusted by R725 on the chassis to get the proper degree of modulation.

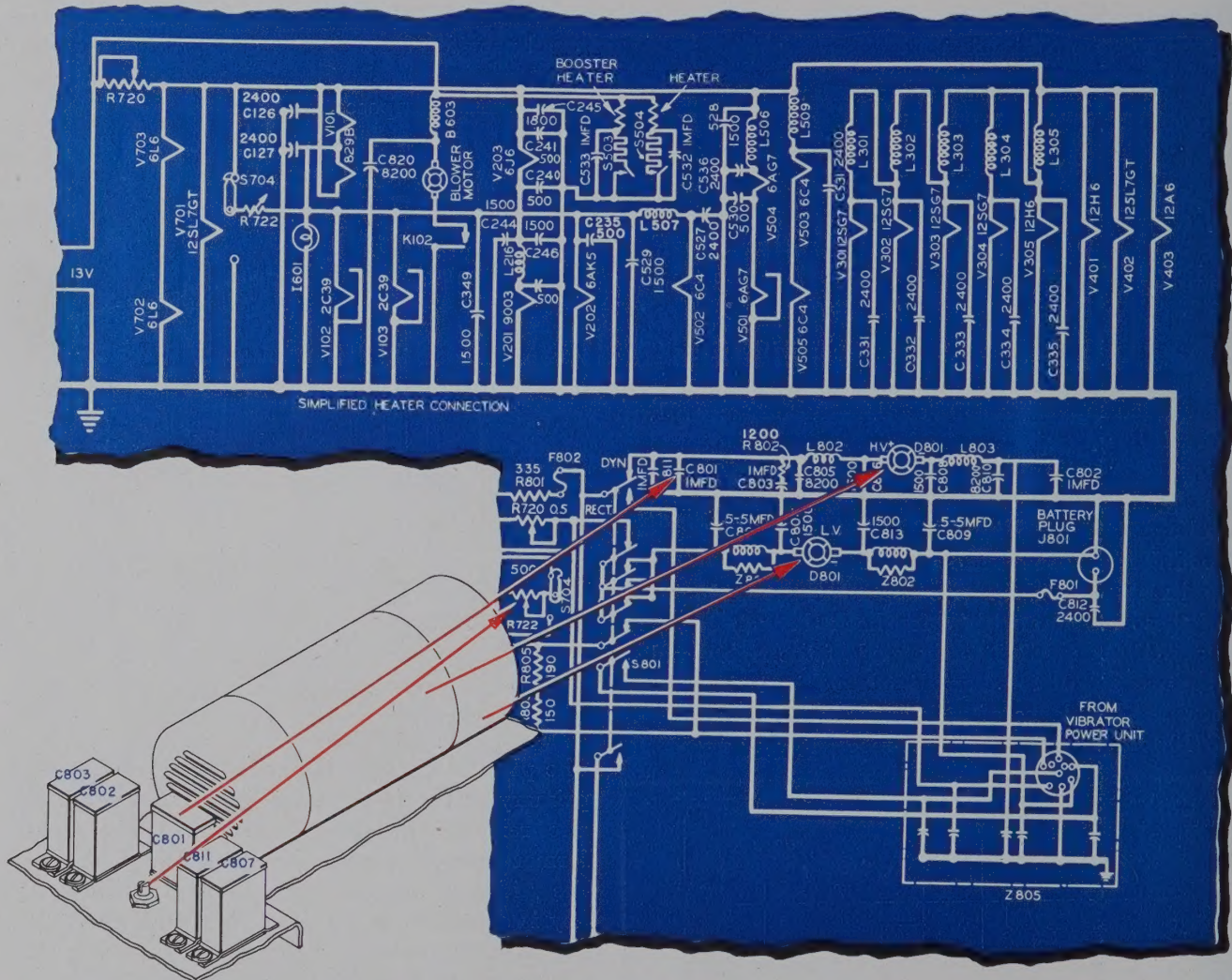
DYNAMOTOR POWER SUPPLY

The dynamotor built into the Modulator-Dynamotor chassis is intended to furnish high voltage plate current for the operation of transmitter and receiver when a direct current source of 13 volts from radio jeep or landing craft is utilized for power.

The supply voltage is used direct to operate the tube filaments and heaters. A parallel-series arrangement as shown in the simplified heater connection is used to provide correct voltage for the tubes requiring 6.3 volts for cathode heating. Heating circuits are equipped with filter chokes and capacitors to keep RF currents from the circuits and to prevent interaction between the various tubes in the equipment.

A variable resistor R722 and a link transfer switch S704 are mounted beneath the chassis. Any variations in filament or heater resistance that might unbalance the voltage across the branches of the series circuit can be balanced out by switching R722 across the branch showing too high a voltage.

Ripple filter components and RF filters are connected into both motor and generator circuits of the dynamotor as shown in the illustration. The former are provided to remove any ripple resulting from the commutating action in the generator. The RF filters prevent static or noise interference arising from the brushes in the machine from entering the radio circuits.



UNIVERSAL POWER SUPPLY

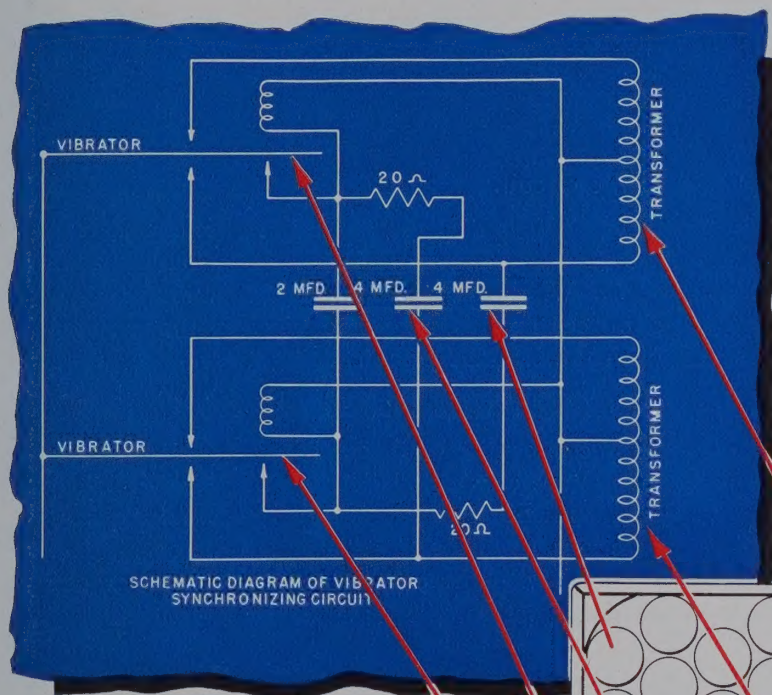
The power supply unit is used in shipboard installations to adapt practically all types and voltages of commercially available electrical power to the requirements of the MAR equipment. On 115 and 230 dc lines this means converting the supply current to ac by means of vibrators and then utilizing transformers and rectifiers to obtain the high plate voltage for the radio equipment. The same transformer system supplies 13V ac for the filament and heater circuits.

When operating from ac supply, it is not necessary to use the vibrators, as the transformers will function directly on the supply current. A set of three switches in the unit is provided to take care of all necessary circuit changes in setting the equipment for use on any given power source. The operation of the equipment is as follows:

OPERATION FROM A DC SOURCE

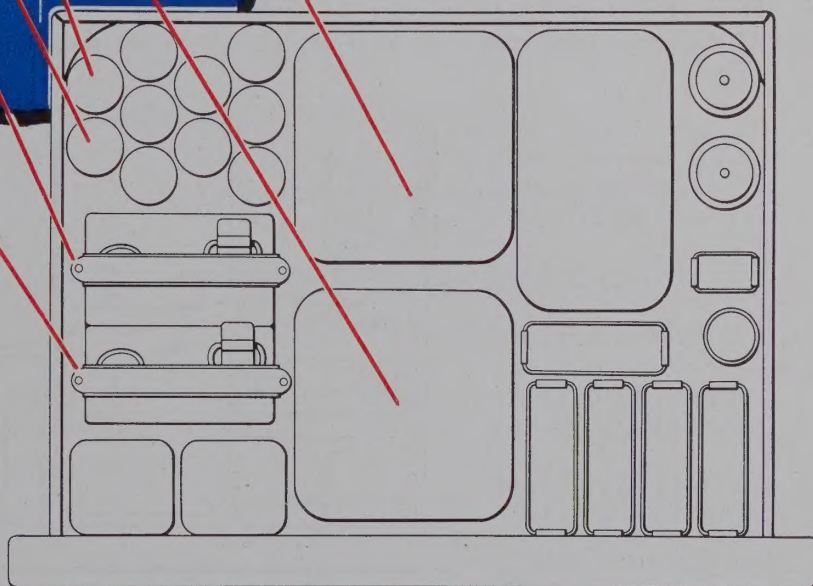
When the MAR radio is turned on, the control relay in the power supply is closed allowing power from the source to flow to the vibrator. The coils of the vibrators are powered at the same time, and the vibrators are immediately activated. The function of the vibrator is to convert dc power to ac power in order to utilize a transformer for voltage conversion. The vibrator accomplishes this by switching the power from one end of the primary to the other end of the primary at a rate of 120 times per second. The return circuit for the power is provided by a center tap in the primary as shown in diagram. The transformer then converts the ac voltage to 13 volts ac to be used as filament power on the MAR and the RDR equipment.

Simultaneously, the transformer converts the greater part of the ac voltage to approximately 800 volts ac, to be rectified to 370 volts dc for the plate power of the radio equipment. Rectification is accomplished by means of two gas rectifier tubes. The 370 volts dc from the rectifier tubes contains a large proportion of ac voltage which would interfere with proper operation of the radio. Therefore, a filtering system is provided to attenuate this ac voltage down to a level inaudible in the radio receiver.



LOAD CONDITION TABLE

MAR radio on receive
 MAR radio on transmit
 MAR on receive plus RDR receiver
 MAR on transmit plus RDR receiver

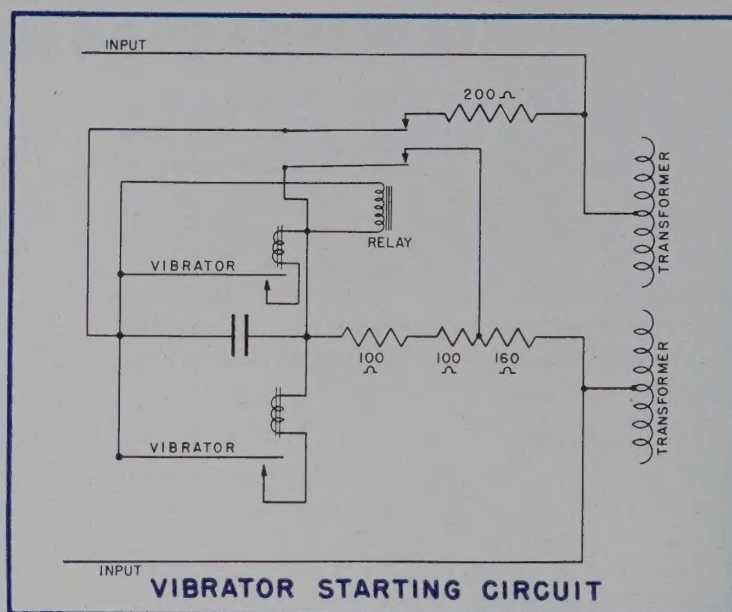


Since the power supply must give the correct output voltages under four different conditions of load (refer to load condition table), it is necessary to control the high-voltage dc. This is done by means of relays. Thus when only a receiver is operating, there is approximately 200 ohms of resistance in series with the plate supply of the radio.

When the load is increased by turning the radio to the transmit condition, part of this resistance (180 ohms) is short circuited by means of a series relay. When the load is still further increased by the added operation of the RDR receiver, the balance of the resistance is shorted out by means of a second series relay. Thus the voltage is very nearly the same for all conditions of operation.

Two vibrators are used simultaneously and each carries approximately one-half of the total load. The load division is accomplished by connecting the high-voltage windings of the transformers in series. Each transformer supplies one filament output. (One transformer supplies the power for RDR equipment filament and the other for the MAR equipment filament). The two vibrators are held accurately in phase with each other by a synchronizing circuit as shown.

The vibrator coil circuit operates from 26 volts dc. When the power supply is operated from 115 volts dc or 230 volts dc, the voltage is dropped to 26 volts dc through resistors in series with the vibrator coils. The impedance of the vibrator coil circuit on starting is approximately one-third of the impedance of this circuit during operation. To obtain proper starting voltage on the vibrator, part of the series resistance is shorted out of the



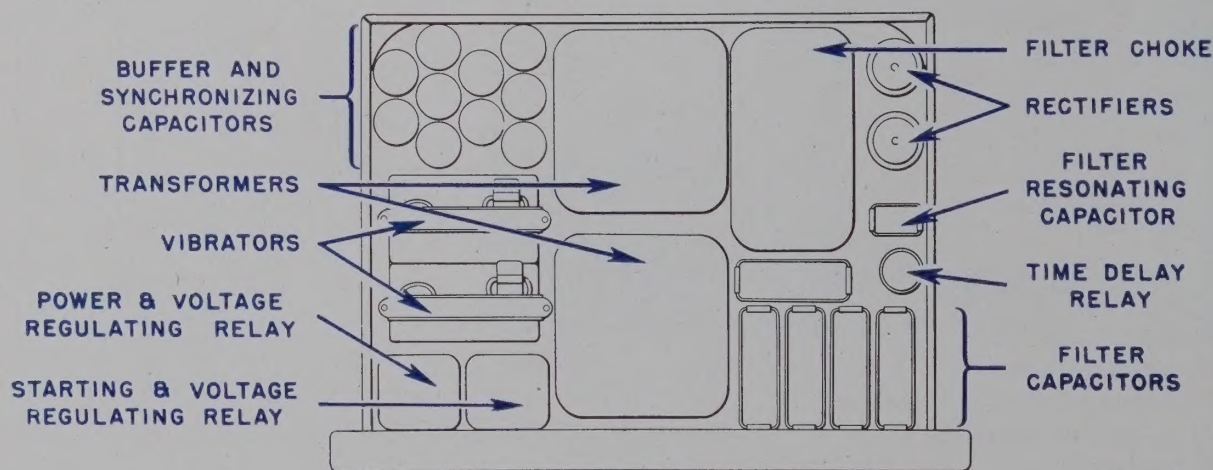
circuit with the starting relay as shown in illustration.

Immediately after the vibrators begin operation, the starting relay coil is actuated. The relay contact opens, thus placing the series resistance back in the circuit.

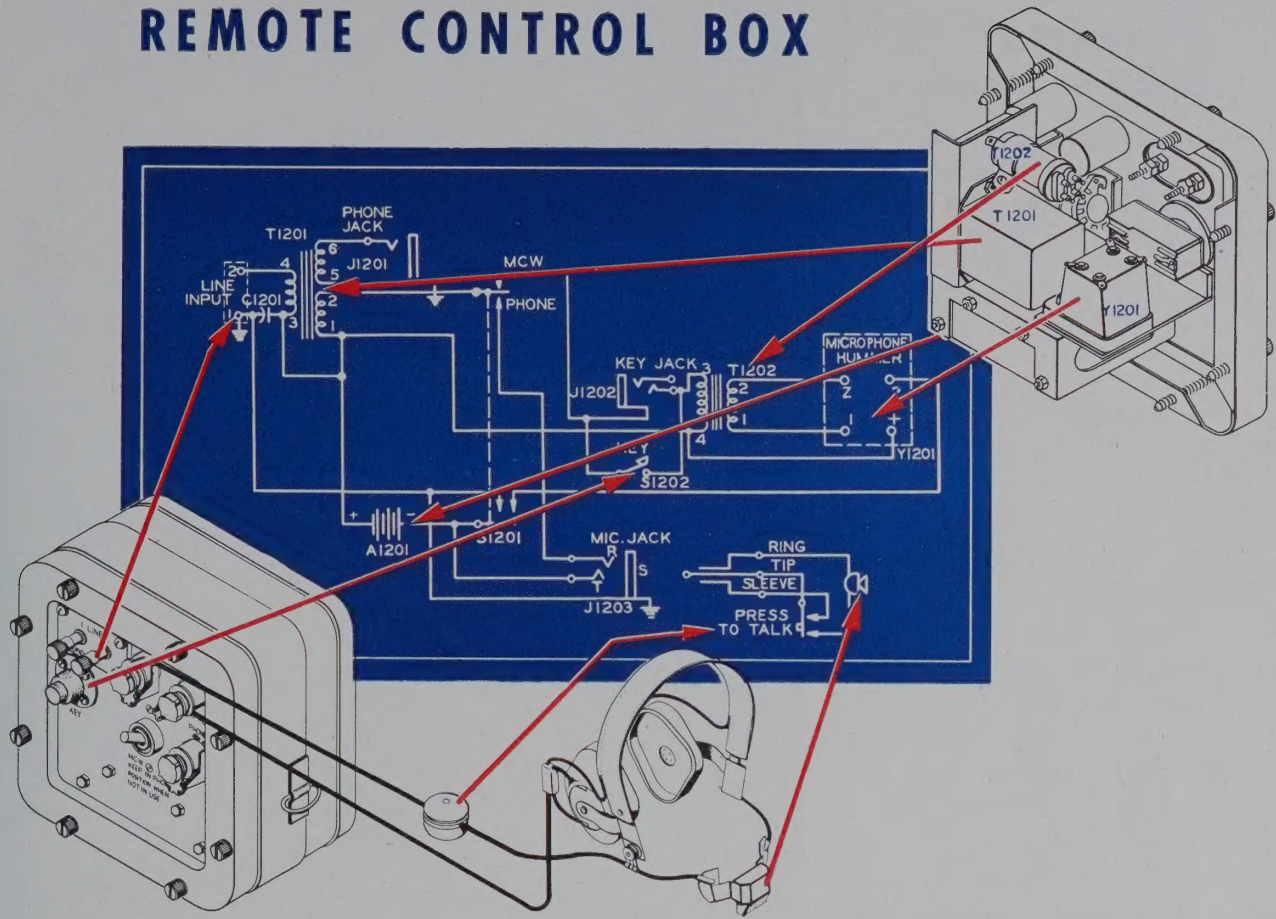
On the 230-volt dc operation, power is supplied to the vibrator center reed through a 200 ohm resistor. When the vibrator is in operation, the 200 ohm resistor is no longer required and is removed from the circuit by the starting relay.

OPERATION FROM AN AC SOURCE

The ac is connected directly into the transformer for voltage conversion. The vibrator is not in the circuit for this condition of operation. The circuit functions, from the transformer to the output, are identical with those described in the paragraphs on dc operation.



REMOTE CONTROL BOX



The illustration associates the components of the remote box with their respective positions in the schematic diagram. Power for operation of this unit is obtained from three flashlight cells as shown at A1201.

A transformer T1201 has one winding connected to the line, which is connected to the radio equipment by a two-conductor cable or twisted telephone wire. A second winding on the transformer connects to the phone jack. A headset plugged in at this point gives reception of signals over the line and permits side tone listening to all transmission from the remote box. The third winding is used as the input for both MCW and phone transmission. For phone communication, a jack is provided for plugging in the microphone and extension cord with press-to-talk switch as shown. A MCW switch on the panel allows signaling by means of the key S1202 built into the box or the loose key plugged into the key jack.

For MCW communication, a local source of audio-frequency current for modulating the transmitter is necessary and consists of the "microphone hummer" Y1201 and its associated transformer T1202. The hummer is essentially a buzzer using a vari-

able resistance element similar to a microphone button to vary the current through the magnet. The pulsating potential across the hummer magnet coil is applied to the primary of transformer T1202. The key in the secondary of the transformer interrupting the audible note fed to the line transformer T1201.

When the MCW-Phone switch S1201 is in the phone position, closing the press-to-talk switch on the microphone extension cord places the battery in series with the line, across capacitor C120, to assist in operating relays in the radio equipment. The battery circuit is also closed through microphone and primary winding on transformer T1201. Voice currents will then be coupled into the line, flowing freely through capacitor C1201 in series with the transformer secondary.

Placing the switch S1201 in the MCW position closes the battery circuit to the line as previously mentioned and to the hummer. Modulating audio currents are then coupled into the line by transformer T1201 when the key is operated. The switch should be left in the PHONE position except when MCW signals are being transmitted to avoid discharging batteries unnecessarily.

RELAYS IN CONTROL CIRCUITS

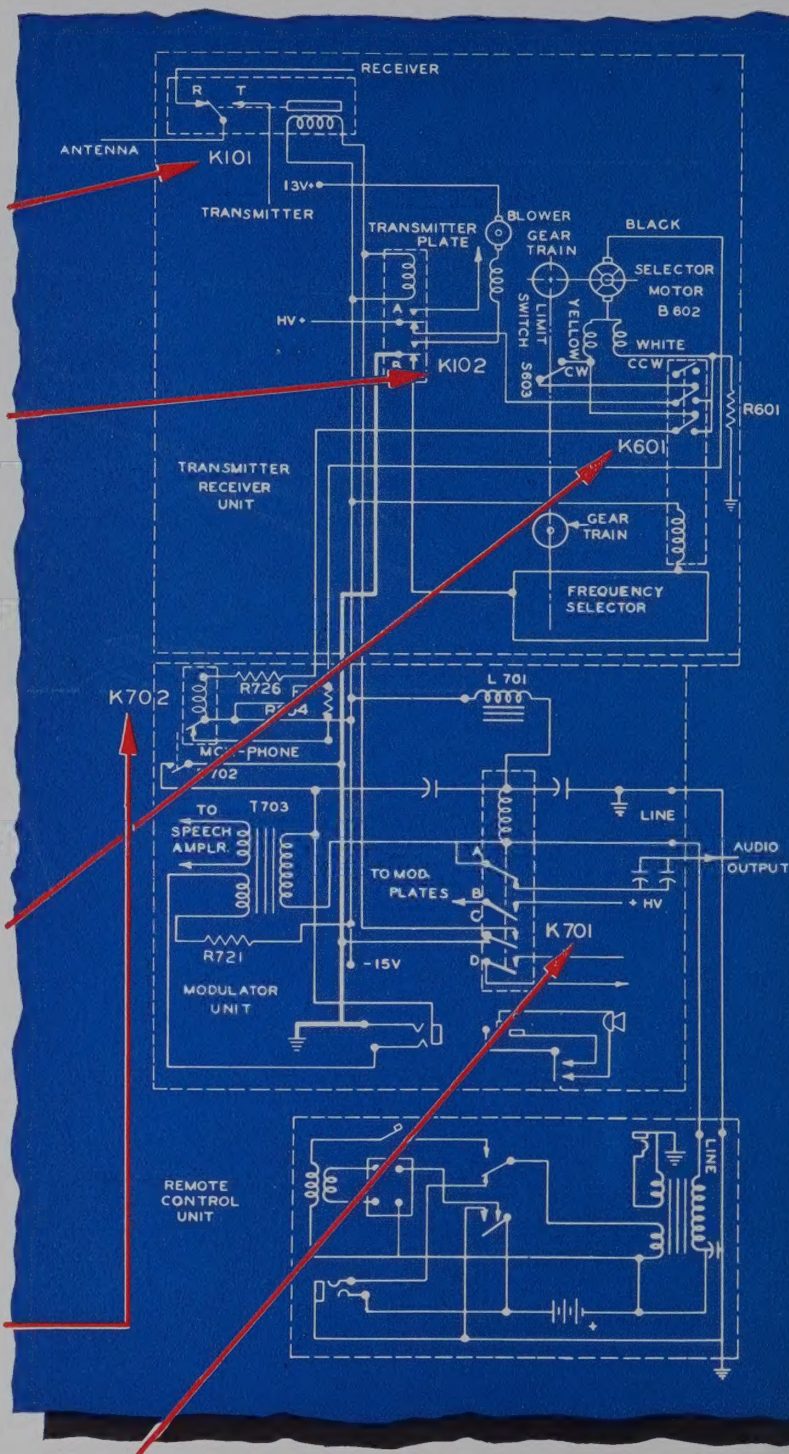
K101—ANTENNA TRANSFER RELAY transfers antenna lead, from its normal connection to receiver, to the transmitter, when energized by closing of relay K701.

K102—TRANSMITTER PLATE RELAY contacts at A normally close the HV circuit to the Selector relay K601 contacts for operating Selector Motor. Contacts at B close circuit to Frequency Selector Switches for operating relay K601.

When energized by relay K701 during transmission, contacts at A connect +HV to plates of transmitter tubes and contacts B close circuit to start blower motor for cooling tubes in transmitter section.

K601—SELECTOR MOTOR RELAY contacts at C control operation of voltage Regulating relay K702. When the relay is energized by manipulation of the Frequency Selector Switch, contacts B close the circuit to the motor for counter-clockwise rotation. When the relay is de-energized, contacts B close the circuits for clockwise rotation of the motor till the Limit Switch opens.

K-702—VOLTAGE REGULATING RELAY—The function of this relay is to regulate the voltage applied to the selector motor B602. The coil of the relay is connected across the motor terminals by contacts on relay K601. Should the voltage across the motor exceed 190 V, the relay contacts open to place resistor R804 in series with the motor to reduce the applied voltage. Should the voltage across the motor fall to 140 V, the relay contacts close to short out resistor R804 and increase the voltage to the motor.



K-701—TRANSMITTER TO RECEIVER RELAY—This relay acts as a master control to operate both the Antenna Transfer Relay and the Transmitter Plate Relay.

In the de-energized condition, contacts A connect the output of the receiver to the line terminals through two fixed capacitors. When the relay is energized, contacts A disconnect output of receiver from line terminals. Contacts B close circuit to modulator tube plates. Contacts C close to energize relays K101 and K102. Contacts D short a resistor R804 to increase voltage to transmitter.

CONTROL CIRCUITS

The MAR equipment must operate under conditions that require a minimum of effort on the part of the operator in changing channels, transmit-receive switching and shifting to code communication as circumstances demand. Much of this switching is done by a system of relays built into the equipment. The simplified schematic diagram on the opposite page shows the circuits of the five relays, three in the Transmitter-Receiver and two in the Modulator-Dynamotor, that perform the important functions of circuit switching.

The functions of the various relays are given opposite the schematic, and their sequence of operation becomes evident with a little study.

When the equipment is switched on and in the receiving condition, the relays will be in the positions shown.

With the microphone and press-to-talk switch plugged into the modulator-dynamotor unit, closing the talk switch will draw current from the —15V line through L701, coil of K701 as well as closing the microphone circuit through T703. Relay K701 pulls up and operates the four sets of contacts and puts the transmitter into operation.

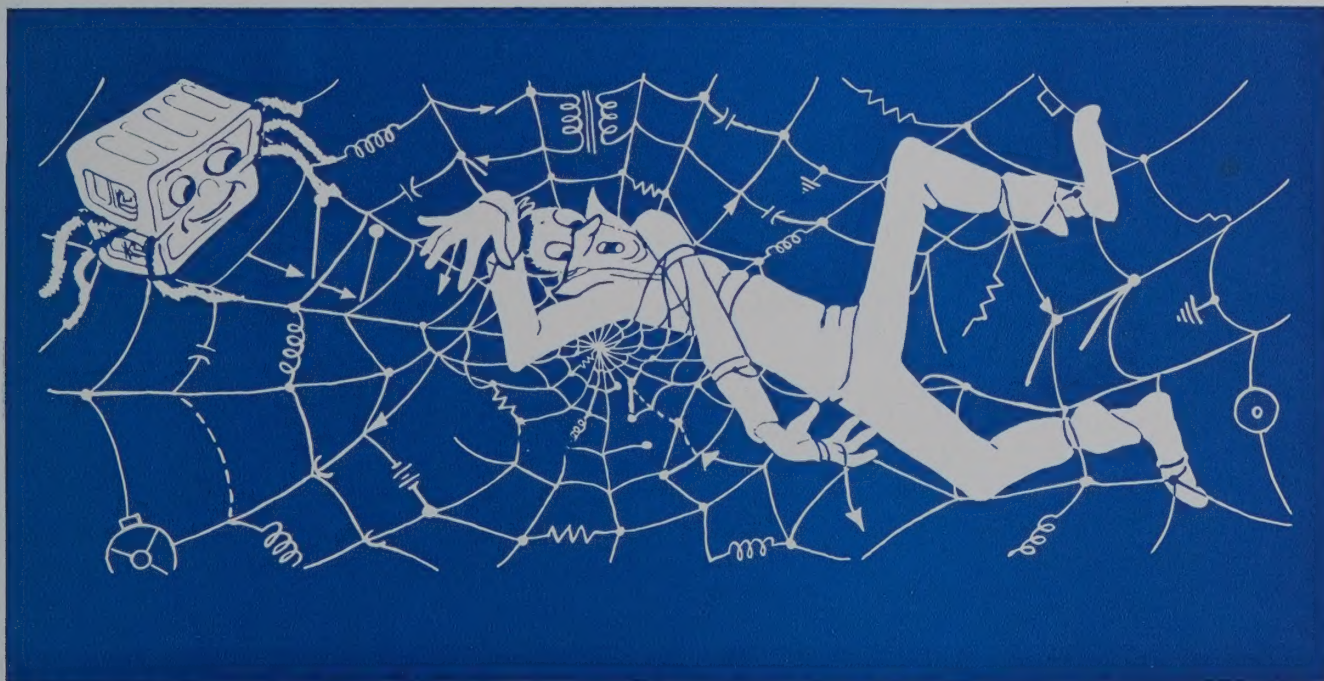
Contacts C on K701 energize both K101 and K102, the former to transfer the antenna from receiver to transmitter, the latter to start blower motor and also switch current into transmitter plate circuits.

Note that K702 removes potential from the frequency selecting motor circuits, so that it is impossible to change channels while the transmitter is in operation. Releasing the press-to-talk switch allows all relays to drop back to receiving position.

A similar relay action is obtained when the press-to-talk switch is closed on the microphone cord at the remote box. The one exception is that the local 4.5V battery in the remote box is switched into the line in series with the current derived in the equipment to offset the voltage drop in the line to the remote box and to assure satisfactory operation of relay K701.

When the MCW-Phone switch on the modulator-dynamotor panel is moved to MCW position, a contact on this switch completes a circuit through the magnet of K701 to place the transmitter in operation while keying. The switch must be moved back to phone position for reception.

At the remote box, the MCW-Phone switch also connects local battery to the line and actuates K701 to switch on the transmitter. In both voice and MCW communication from the remote box, the audio frequency currents are superimposed on the direct current in the line holding relay K701. Such currents pass freely through blocking capacitors C1201 in the remote box, C717 and C718 in the modulator circuits to appear as potentials across one primary winding of speech transformer T703.



INSTALLATION AND INITIAL ADJUSTMENTS

SECTION 3



M—A—R

RADIO TRANSMITTING AND
RECEIVING EQUIPMENT

RESTRICTED

SAFETY

This equipment employs voltages which are dangerous and may be fatal if contacted by operating personnel. Extreme caution should be exercised when working with the equipment. Do not change tubes or make adjustments inside the equipment with high voltage supply on. Do not depend upon switches for protection but always shut off power supply. Under certain conditions, dangerous potentials may exist in the circuits with power controls in the off position, due to charges retained by capacitors, etc. To avoid casualties always remove power discharge and ground circuits prior to touching them.

Don't service or adjust alone. Under no circumstances should any person service or adjust the equipment without the immediate presence or assistance of another person capable of rendering aid. Wherever feasible in testing circuits, check for continuity and resistance rather than directly checking voltage at various points.

The attention of officers and operating personnel is directed to chapter 67 of Bureau of Ships or superseding instructions on the subject of "radio precautions to be observed."

An approved poster illustrating the rules for resuscitation by the prone pressure method shall be prominently displayed in each radio, radar or sonar enclosure. Posters may be obtained upon request to the Bureau of Medicine and Surgery.



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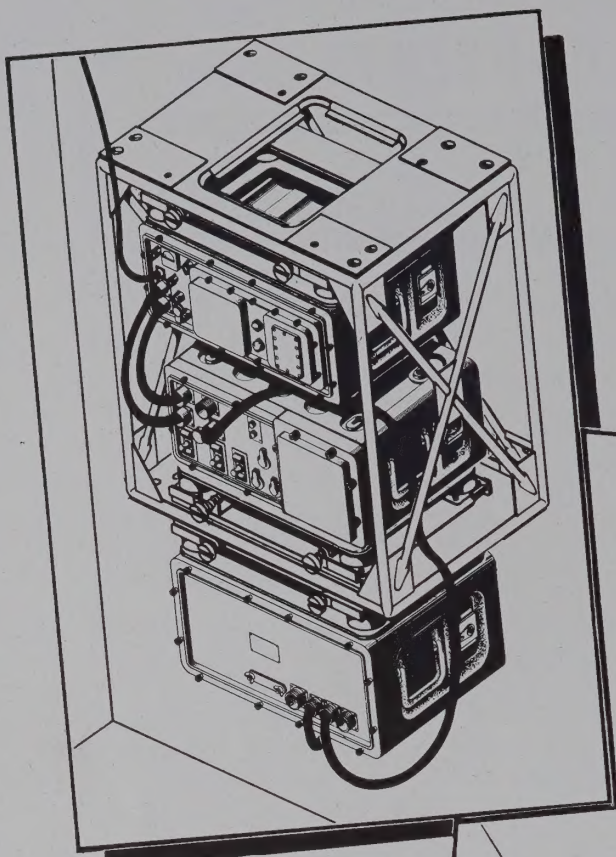
INSTALLATION AND INITIAL ADJUSTMENTS

SECTION 3

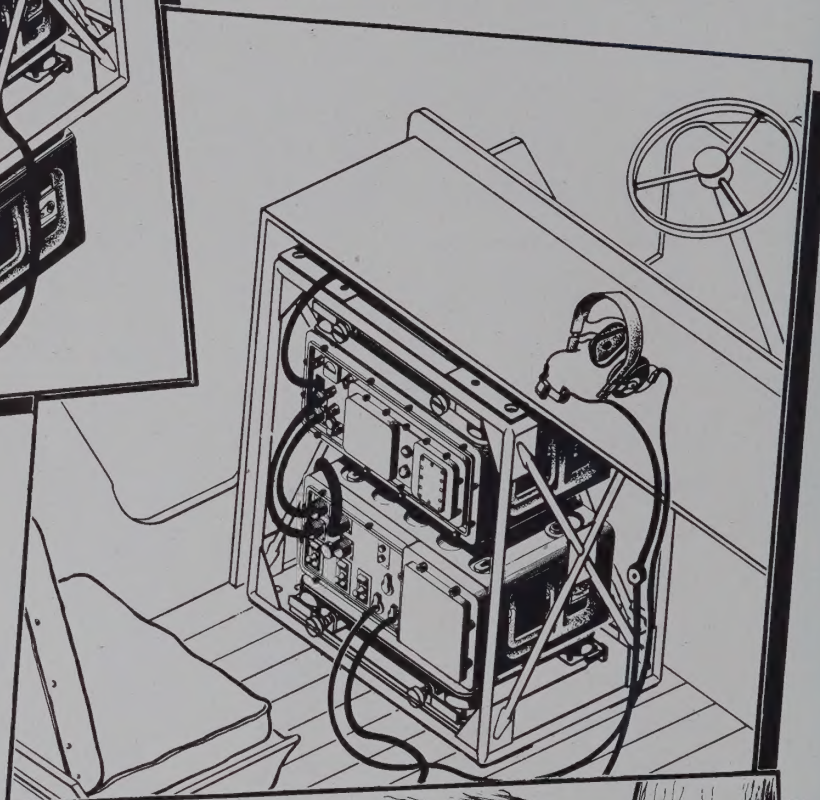
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INSTALLATION REFERENCE
DRAWINGS AND DATA GROUPED
AT THE END OF THIS SECTION

TYPICAL APPLICATIONS OF MAR EQUIPMENT

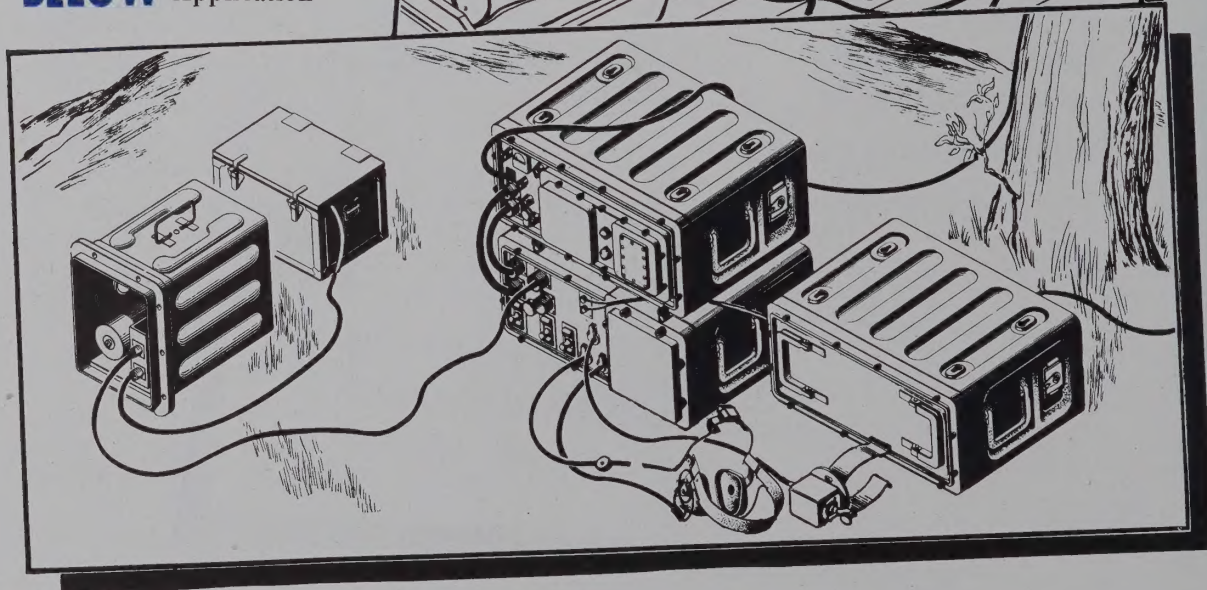


ABOVE Shipboard
Installation



RIGHT Jeep or Mobile
Installation

BELOW Field
Application



INSTALLATION OF MAR EQUIPMENT

The Basic MAR Equipment is designed to permit its installation in various types and sizes of vessels, and on mobile units for service on shore as well as for field duty in isolated positions. To adapt the equipment to the conditions under which it must operate, an installation kit will be supplied for each desired service.

Two types of adaption kits are available, one for Shipboard equipment, the other a field adaptation kit. The first and most important function of the kits is to provide proper support for the equipment and to protect it from shocks and damage. The second is to provide the accessories necessary for proper control and operation under the conditions that may prevail.

There is no sharp delineation between the fields of application of the kits; the component parts of the two kits may often be assorted to meet a special set of conditions.

The details of application of a particular kit will usually remain the same under varying conditions, and the instructions that follow will confine them-

selves to a particular application of each kit but can be generally applied to all installations.

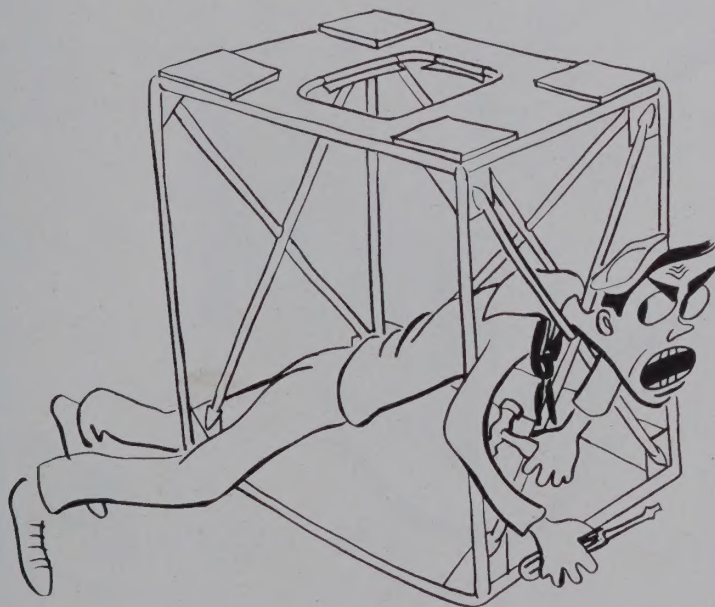
On the opposite page are given the three general types of assemblies the equipment will employ: Shipboard, Radio Jeep and Field application. The ship installation has provision for the addition of a companion receiver on top of the equipment that may be powered from the same power supply utilized with the MAR basic equipment.

In radio jeep installations, the cradle may also be used or the two units of the basic equipment attached by the shockmount frame to supports in the structure of the vehicle. No power supply unit is required with these installations, as the power may be obtained direct from the batteries in the car or truck.

The field application makes use of the cabinet fasteners to clamp the units together when placed on the ground. For isolated positions where power is not available, a gas engine driven unit is employed to furnish the 13 volt direct current on which the equipment operates. An auxiliary storage battery is to be used with this application where transportation facilities permit. The battery assures continued operation of the equipment should it be necessary to shut down the engine unit for repair or adjustment.

Two standard lengths of transmission cable are used with field kits to simplify the erection or removal of the equipment. Necessary cabling is included for connection to gas engine unit and battery case. The individual kits are considered in detail in the following pages.

NOTE—Due to improvement in design, the cradle and shockmounts may differ slightly in appearance from those shown in the illustrations.



SHIPBOARD INSTALLATION

TRANSMITTER -
RECEIVERMODULATOR
DYNAMOTORUNIVERSAL
POWER UNIT

HEAD SET

LIP
MICROPHONE

KEY

SHIPBOARD APPLICATION KIT

The primary purpose of the Shipboard Installation Kit is to adapt the Basic MAR equipment for use on larger vessels as permanent equipment. The kit is suitable for other installations requiring

simply a rigid cradle for supporting the units. The table below lists the components of the kit, the major units and accessories involved.

COMPONENTS OF SHIPBOARD APPLICATION KIT

QUAN.	NAVY TYPE NO.	UNIT	WIDTH INCHES	DEPTH INCHES	HEIGHT INCHES	WEIGHT POUNDS
1	CRV-10506	Bulkhead mounting cradle with 3 shockmounts	27 $\frac{1}{8}$	19 $\frac{1}{8}$	30 $\frac{7}{8}$	150
1	CRV-10507	Shockmount	19 $\frac{3}{4}$	14 $\frac{7}{8}$	2 $\frac{1}{2}$	23
2		Junction Boxes	8	4 15/16	10 $\frac{1}{8}$	7

HARDWARE FOR MOUNTING CRADLE

8	Hex. head capscrews to mount cradle		3/4" x 2 $\frac{1}{2}$ "
8	Hex. nuts, washers and lockwashers		3/4"
8	Hex. head capscrews	} to attach shock mount	3/8" x 5/8"
4	Hex. head capscrews		3/8" x 1"
12	Lockwashers		3/8"

ACCESSORIES

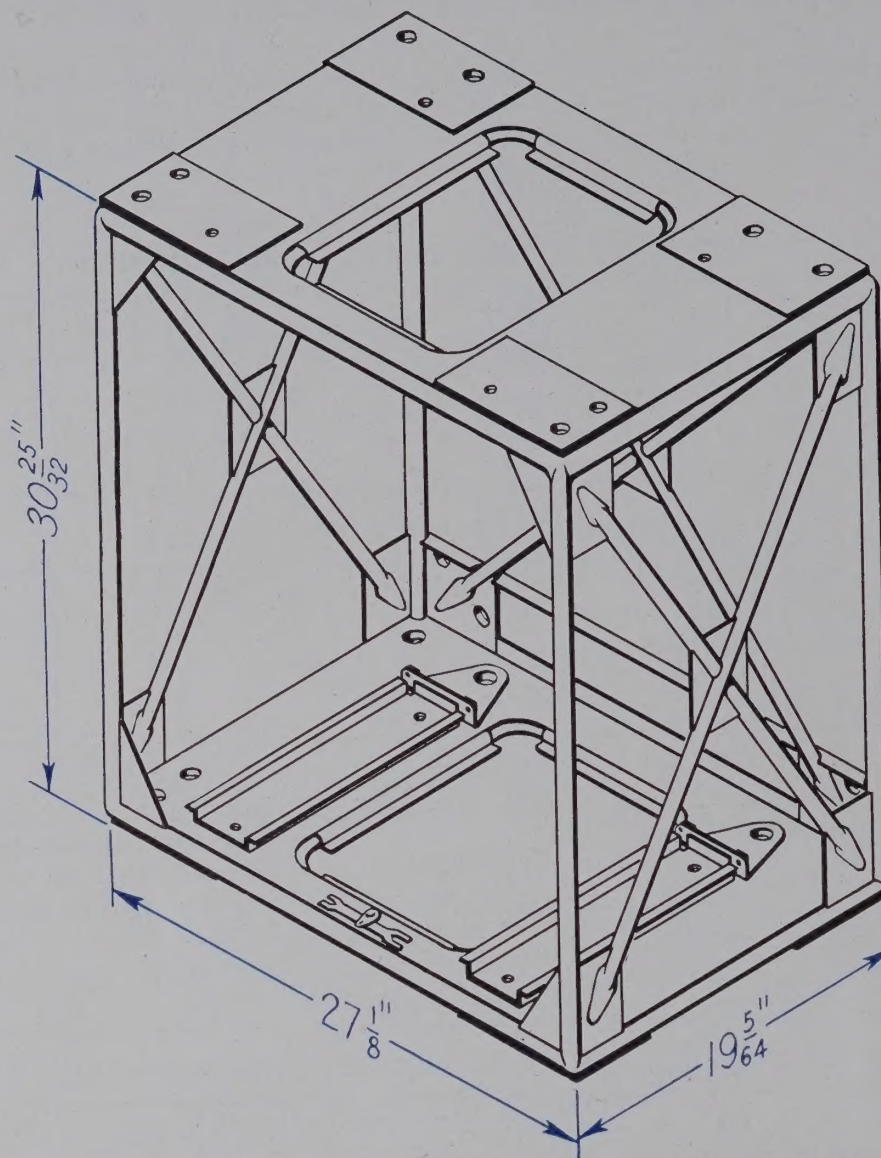
KIT ACCESSORIES		Material required but not furnished:
1 5 ft. phone cord and plug	2 Type UG-167/U reducing connectors	Cable for connecting Universal Power Unit to power supply.
1 5 ft. microphone cord and plug	1 Type UG-29/U adapter	Antenna transmission line RG 10/U or RG 18/U
1 Type UG-23/U jack	1 Type UG-21/U plug	
	1 CRV-10508 shockmount	

BASIC MAR EQUIPMENT FURNISHED WITH SHIPBOARD KIT

QUAN.	NAVY TYPE NO.	UNIT	WIDTH INCHES	DEPTH INCHES	HEIGHT INCHES	WEIGHT POUNDS
1	CRV-43067	Transmitter-Receiver	21	16	9	45
1	CRV-50248	Modulator-Dynamotor	21	16	9	45
1	CLG-20379	Universal Power Supply	21	16	10 $\frac{3}{8}$	100
1	CRV-66147	Antenna		25	22	3 $\frac{1}{2}$

ACCESSORIES WITH BASIC MAR EQUIPMENT

In Modulator-Dynamotor compartment 1 set of operating spare tube—1 of each type used 1 Headset 1 Headset extension cord 1 Lip microphone 1 Microphone extension cord 1 Telegraph key without knee clamp	With antenna 1 Shipboard clamp 2 Transmission line connectors (loose) 1 Coupling adapter unit In Accessory Box 2 Interconnecting cables 1 Battery cable, with clips 1 Power cable from power unit 1 Set operating spares, less tubes 2 Plugs for input to power unit
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MOUNTING THE CRADLE

NAVY TYPE CRV-10506

The cradle furnished with the shipborne application kit is shown in the illustration. It consists of a welded structure, built up from $1\frac{1}{8}$ inch stainless steel tubing gusseted and braced as shown. All joints are butt-welded to give a light rigid construction with no protruding corners. The frame, with the exception of the slides, is furnished in Marine Corps green.

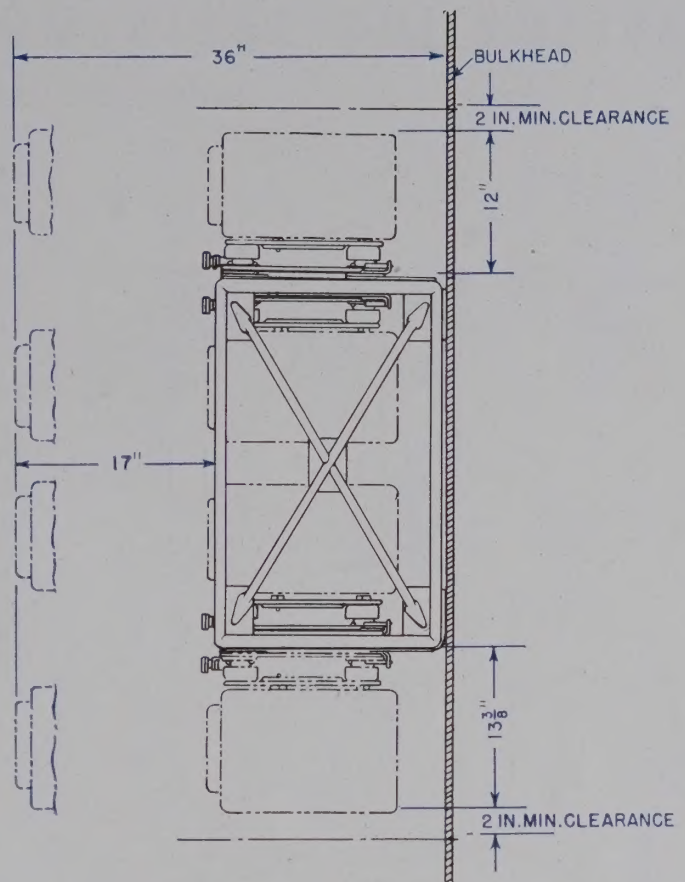
Beneath top and on the bottom of the cradle are welded slide members to receive the shock mounting slides to be bolted to the equipment cases. Thus one case, the Transmitter-Receiver, can be slung from the top of the cradle by shockmounts. The other case containing Modulator-Dynamotor can be mounted on the bottom with shock mounted slides.

The cradle is designed to be attached to the wall or bulkhead and the illustration gives mounting dimensions, when drilling is necessary, to pass $\frac{3}{4}$ inch bolts for supporting the cradle. Dimensions are also given for bolting the cradle to the floor or other support. Clearance required in front of the cradle for removal of units are also given on this page.

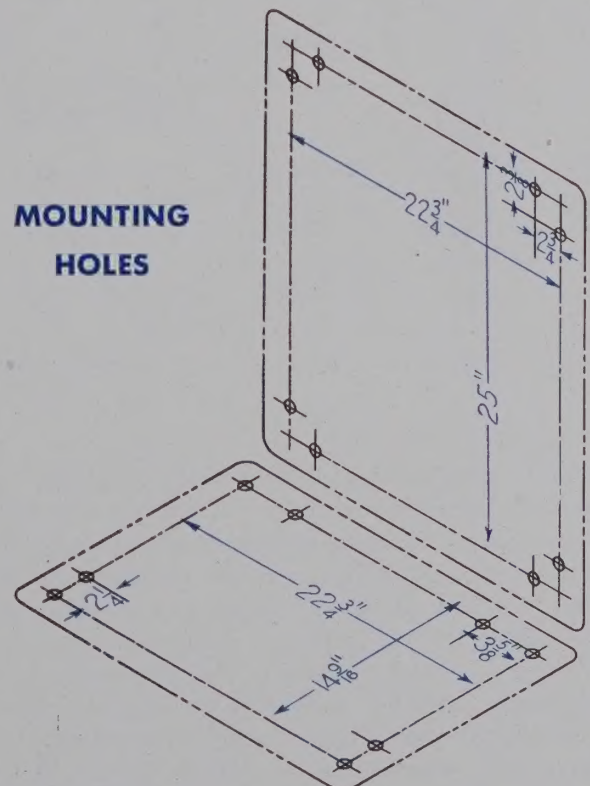
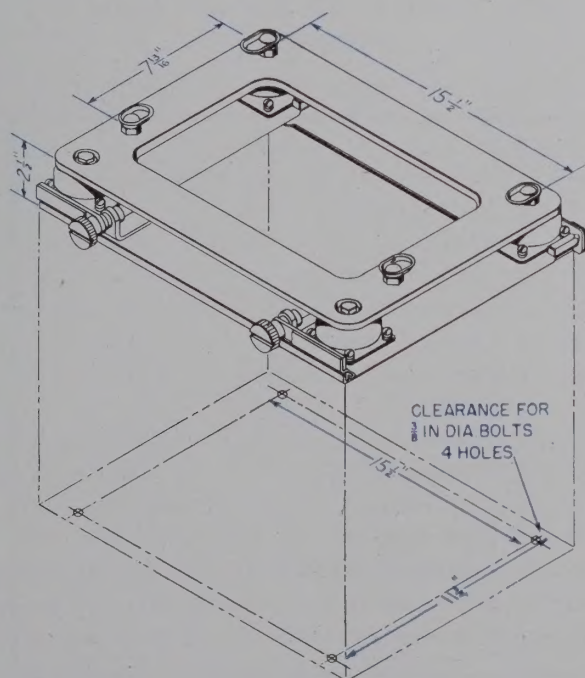
It will be noted that two extra units are shown in dotted lines, above and below the cradle. To accommodate such units, which may be the Universal Power Supply Unit slung under the cradle and a companion receiver, the RDR, on top, threaded fittings are provided to receive capscrews that hold the base plates of the shockmount units for these units.

Drilling information is also given in the illustration for the shockmount bases when it is desired to use these for mounting the equipment on the floor or other support, where the cradle would be impractical.

To install the cradle, select the position it is to occupy, giving due consideration to space required for installing and removing cases. Lay out the necessary mounting holes on the bulkhead and drill same using a $\frac{3}{4}$ clearance drill. The cradle is then bolted into place, using the eight $\frac{3}{4}$ -inch bolts, washers and nuts provided in the kit.

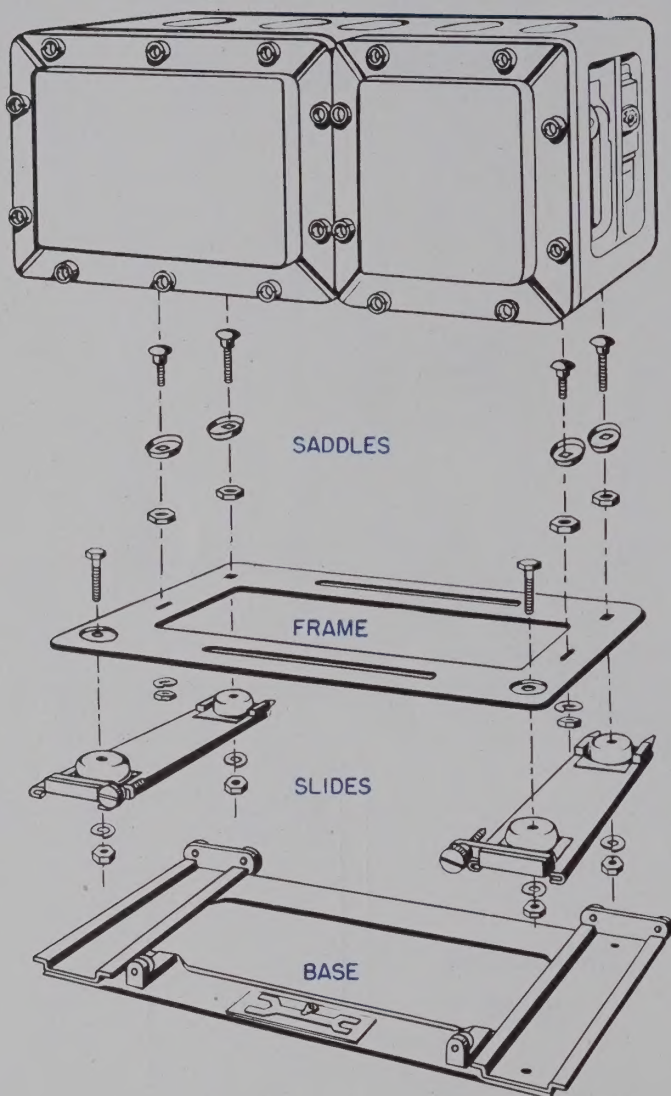


The cradle must be rigidly mounted in place. Before the units can be installed they must be fitted with the proper shockmountings.



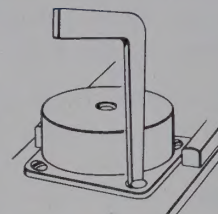
ASSEMBLING SHOCK MOUNTS ON THE UNITS

NAVY TYPE CRV-10507

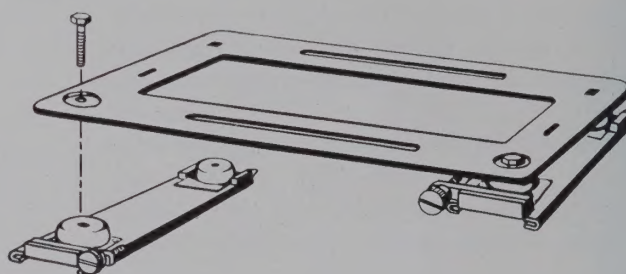


The shockmounts are attached to the units by means of the keyhole slots that will be found on both top and bottom of the cases enclosing the units. The spacing of these slots is uniform on all the cases and allows for stacking or grouping the equipment in practically any desired arrangement. Thus by properly attaching the shockmounts, a given case may be suspended or supported from beneath. The table below lists the parts that make up a single shockmount assembly.

Three shockmounts rated for a 45-pound load are furnished with the cradle. Two fit the slides welded to the cradle. The third is to be mounted on top when a companion receiver RDR is used. A fourth shockmount rated for a 100-pound load is furnished separate, for use with the power supply unit.



To attach the shockmounts to the cases, it will be necessary to dismantle the mount to the point where the two slide members are attached to the flat frame member only by the two hex head bolts that pass through the frame and shockmounts at the front edge of the frame. The bolts will hold the assembly together until it can be attached to the case.



COMPONENTS OF SHOCK MOUNT ASSEMBLY

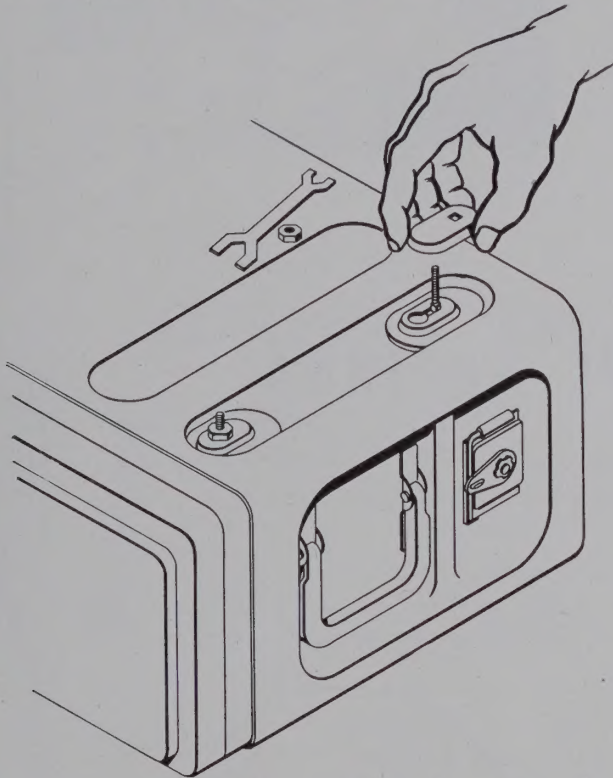
NAVY TYPE No. 10507

QUAN.	PART
1	Base Assembly
1	Frame Assembly
2	Slide Assemblies
2	Carriage bolts 5/16
2	Carriage Bolts 5/16
2	Hex. Hd. Mach. Bolt 5/16
4	Saddles
4	Shockmounts
4	Hex. nuts (large) 5/16
8	Hex. nuts 5/16
6	Lockwashers 5/16
16	Fillister head screws 12-24 x 3/8
16	Lockwashers 12-24
2	Washers 5/16

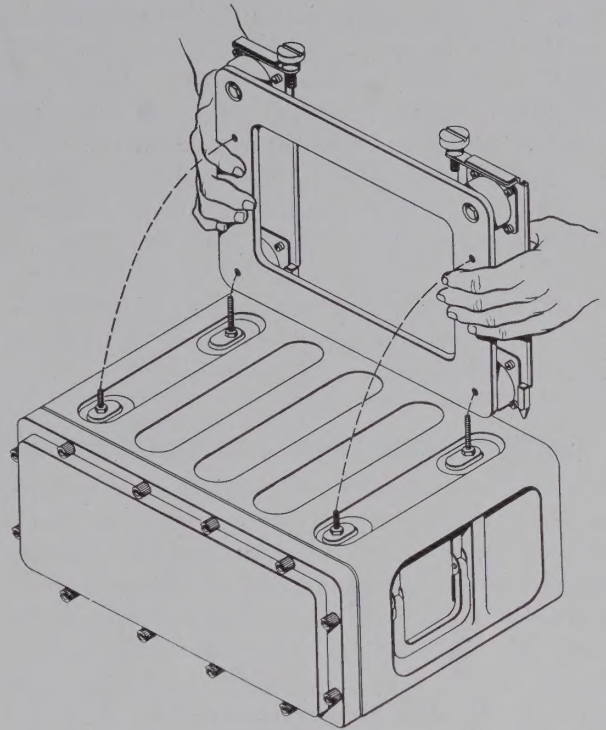
The case is then prepared for receiving the mount by fastening the carriage bolts into the keyhole slots on the side of the case to which the mount is to be attached. Thus, for the transmitter-receiver case, the bolts are put in the top of the case when the unit is to be hung in the cradle. The modulator-dynamotor case should have the bolts placed in the bottom.

Two short and two long carriage bolts are provided for each case. To attach the bolts, lay the case on its side, insert the head of a short carriage bolt in the keyhole slot nearest the cover of the equipment, and slide the bolt to the end of the square slot. Drop one of the saddles provided over the bolt shank with flanges facing down and screw a large nut, with the counterbored side down, onto the bolt threads. An open end wrench is attached to the base of the shockmount for tightening this nut.

The same procedure is followed, as shown in the illustration, in attaching the long carriage bolts in the keyhole slots nearest the back of the case.



To install the slides, grip slides and base as shown in illustration, holding holes in shockmounts in line with holes in frame, and place on top of bolt ends, entering bolts into holes as indicated. Lockwashers are placed on the bolts and the nuts started on the bolt threads and pulled tight with small end of wrench. Tighten nuts in shockmounts originally used to hold slides to frame.



This completes the installation of the shockmounts, and the unit is ready for installation in the cradle. The two thumbscrews on the front end of the slides will line up with threaded brackets in the cradle and will clamp the slide assembly firmly in the cradle.

The mount may be installed on the modulator-dynamotor case in the same manner, making certain it is attached to the bottom of the unit. This will allow the unit to slip into its proper place at the bottom of the cradle. The Universal Power Supply Unit has the mount attached to the top, using shockmounts rated for 100 lb. load on the slides for this unit.

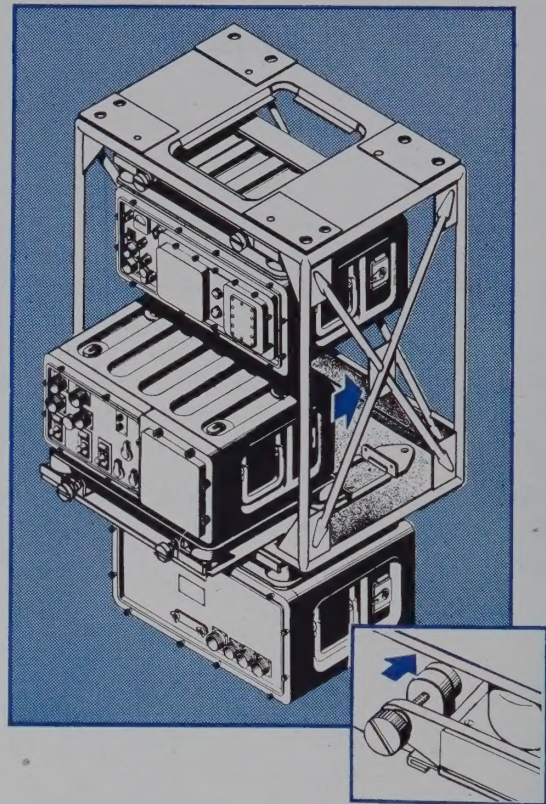
To support the power unit below the cradle it will be necessary to install a shockmount base in an inverted position. Tapped holes are provided in the bottom of the cradle frame for the capscrews and lockwashers that are used to hold the base in position. No drilling is necessary. Support the base inverted below the cradle, with the tapped lugs to the front, and put the four capscrews in plate in the holes in the base. Tighten the screws into place with the open end wrench furnished with the cradle.

ASSEMBLING THE MAJOR UNITS

With the cradle in place and the shockmountings attached to the cases of the units, the equipment can be assembled for interconnection. The Transmitter-Receiver is slid into place on the slides attached to the underside of the top of the cradle and locked into place by tightening the thumb-screws attached to the slides on the shockmounts. The Modulator-Dynamotor is put into place, as shown in the illustration in the lower part of the cradle, and fastened. As previously mentioned, the Universal Power Supply is slid onto the base attached to the bottom of the cradle.

INTERCONNECTING THE EQUIPMENT

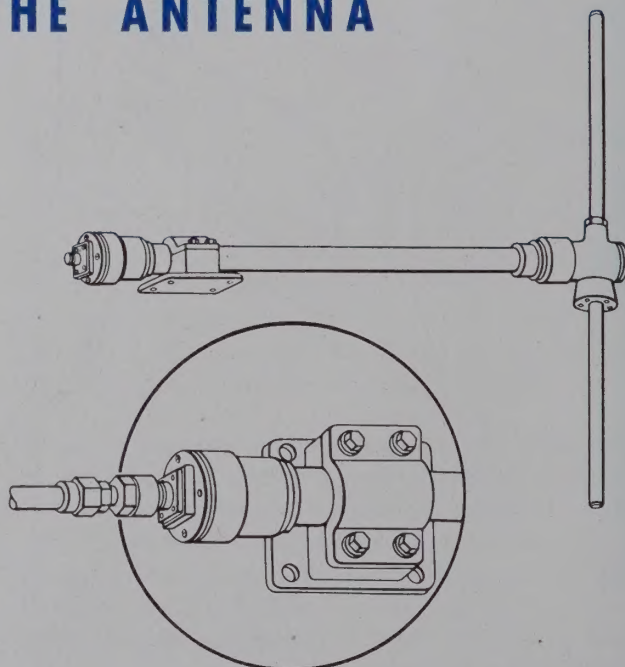
After the cases are properly mounted and fastened in place, the outer waterproof covers can be removed from the units by using the Allen wrench clipped to the right-hand end of the cases or the screwdriver clipped to the left-hand end of the cases. The right-hand compartment of the modulator-dynamotor unit contains the operating accessories for the equipment. There will also be found ten silica gel dryer units that must be installed in the cases.



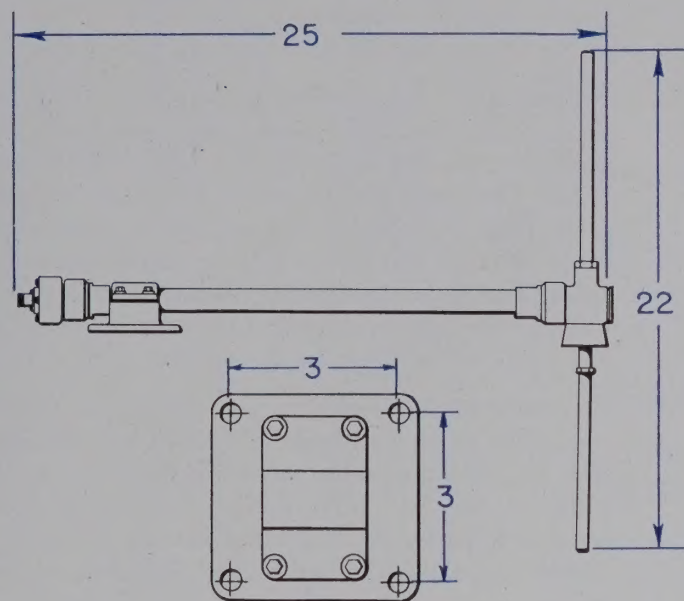
INSTALLING THE ANTENNA

The antenna should be installed in a clear space as far as possible from all surrounding objects. In no case should any metallic objects be closer than $1\frac{1}{2}$ feet to the radiating dipoles. If the height of such metallic objects approaches or exceeds the length of the dipole, the dipole should be at least $4\frac{1}{2}$ feet removed from them. As shown on the outline drawing, the mounting clamp as furnished with shipboard kit is designed for use on a flat surface. As pictured on the drawing, the clamp is in the proper position for mounting on a horizontal surface.

If it is desired to mount it on a vertical surface, the clamp must be loosened and turned at right angles to the position shown. The mounting clamp must always be placed at the far end of the assembly, i. e., as far as possible from the dipole rods.

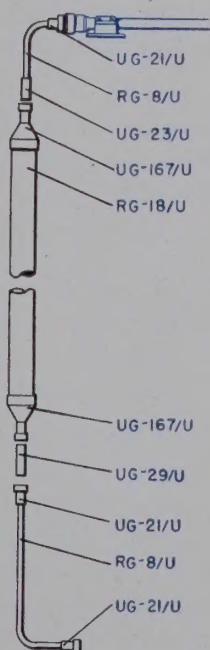


The dipole rods are removed for convenience in shipping. The first step in installing the antenna is to replace these rods. The rod with the coarse thread is the grounded rod. It should be screwed into the $\frac{1}{2}$ -inch hole in the casting on the end of the assembly. Screw rod in until it bottoms in the hole and tighten lock nut securely. The rod with the smaller, finer thread should be screwed into the stud protruding from the insulator and tightened in the same manner as the other rod.



If desirable, the clamp may be removed from the antenna for convenience in installing it. Mount the clamp in the desired position with four $\frac{3}{8}$ -inch bolts in the holes provided for them. Lay the antenna in the bottom half of the clamp, rotating the assembly so that the dipole rods are vertical and the insulated rod pointing down. Place the top half of the clamp in position and fasten with the four screws. Make certain that the clamp is located as far as possible from the dipole rods.

INSTALLING THE TRANSMISSION LINE



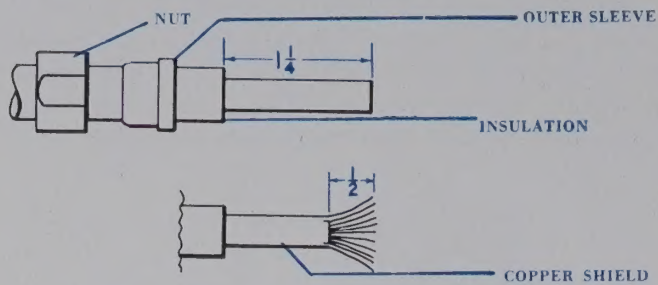
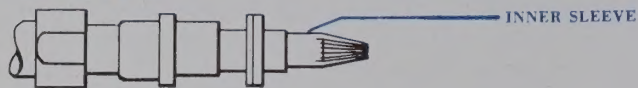
The transmission line is made up from stock coaxial cable in the shipboard installations. Necessary plugs are furnished for making the installation to meet conditions where the distance to the antenna is unusually great.

For installations where the transmission line is short, two RG 21/U plugs are provided with the basic equipment to be utilized with RG 8/U or RG 10/U coaxial cable.

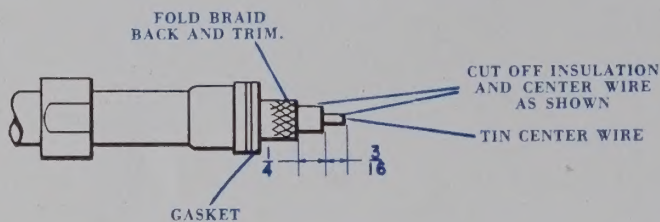
To make the installation, a length RG 8/U cable is cut from a stock supply to reach from point of installation of the antenna to that of the radio equipment. Plugs are then attached to the ends of the cable as shown in the illustration giving the details of each step of connecting the plugs.

The cable is installed in position and rigidly attached to available supporting members by clips. In making connection to the antenna, the transmission line cable should be installed so that it runs at right angles to the dipole rods on the antenna, either directly away from the back connection of the antenna or off to the side of the assembly. If it is necessary to run the line parallel to the antenna rods at any point, the parallel section should be located at least $4\frac{1}{2}$ feet from the dipole.

1 CUT INSULATION BACK

2 FLARE COPPER SHIELD OUT, CUT OFF CENTER WIRE AND INSULATION $\frac{1}{2}$ FROM END. PURPOSE OF THIS IS TO LEAVE CLEAN CUT END.

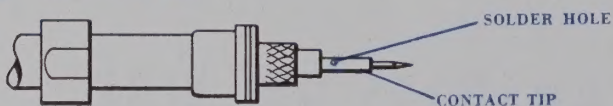
3 FORM COPPER SHIELD INTO CONE SHAPE AND SLIDE INNER SLEEVE OVER COPPER BRAID.



4 FOLD BACK COPPER SHIELD ON INNER SLEEVE AND TRIM.

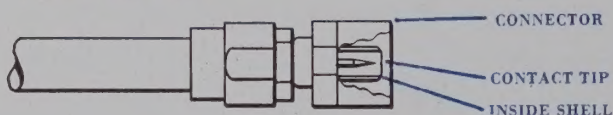
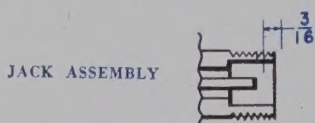
5 CUT INSULATION AND CENTER WIRE AS SHOWN.

6 TIN CENTER WIRE



7 SOLDER CONTACT TIP IN PLACE. FILL HOLES WITH SOLDER. OUTSIDE SHALL BE FREE OF SOLDER.

8 SLIDE CABLE INTO CONNECTOR AND SCREW NUT TIGHTLY IN PLACE WITH A WRENCH. SEE NOTE

9 PLUG ASSEMBLY END OF CONTACT TIP MUST BE FLUSH WITHIN $\frac{1}{64}$ WITH END OF INSIDE SHELL.

NOTE:

DO NOT TURN BODY WHILE TIGHTENING NUT AS THIS (1) TWISTS THE RUBBER WASHER MAKING THE CONNECTOR NON-WATERPROOF AND (2) MAY SHEAR OFF COPPER SHIELD MAKING A DISCONTINUITY OF GROUND

When the distance from the equipment to the antenna is unusually long, additional plugs and jacks are provided for splicing in a section of RG 18/U low-loss coaxial cable, as shown in the illustration. The additional fittings required are furnished with the shipboard installation kit and consist of the following:

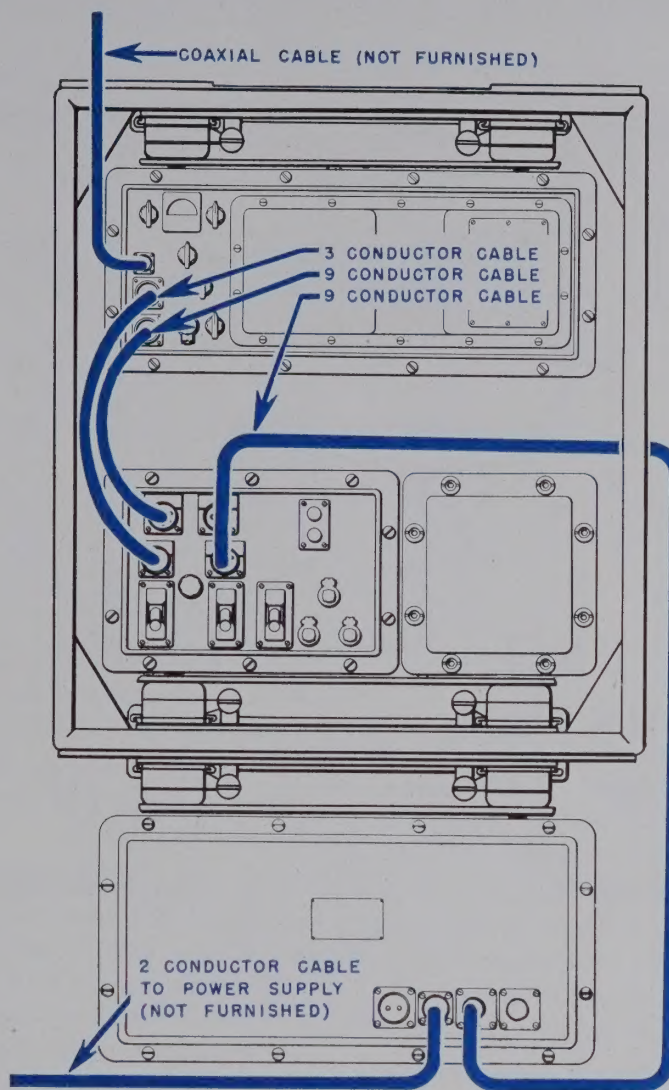
- 2 UG 167/U plugs
- 1 UG 23/U jack assembly
- 1 UG 29/U coupling
- 1 UG 21/U connector and pin

To install the larger transmission line cable, it is first necessary to make up the two short cables indicated in the illustration at the ends of the larger cable. The short cables provide flexibility at both ends of the transmission line and may be of lengths other than shown, if desired. In certain installations it may be possible to eliminate the short cable at the antenna end and connect the heavier RG 18/U cable direct to the antenna jack.

The jacks are connected to the cable by the same procedure as used with the plugs and no difficulty will be encountered in attaching the UG 167/U plugs to the RG 18/U cable. After plugs and jacks are connected, the cable can be connected together by tightening up the coupling nuts on the plugs.

In field installations the transmission line cable comes with the antenna and consists of a 10-foot cable, fitted with plugs. A 50-foot cable fitted with plugs and a coupling unit for joining the 10- and 50-foot cables is included with the field application kit. Installation in this case is simply a matter of connecting the cable to the equipment and the antenna, using the connector furnished to join the two cables if necessary.

The antenna in the field application kit is fitted with a chain clamp for attaching the assembly to a post or tree, as may be available.



CONNECTING THE EQUIPMENT

The interconnection of the units is accomplished by connecting the proper cables to receptacles on the panel of the units. In the Accessories Spare Box will be found cables and connectors to make the entire installation with the exception of antenna cable and power feeders.

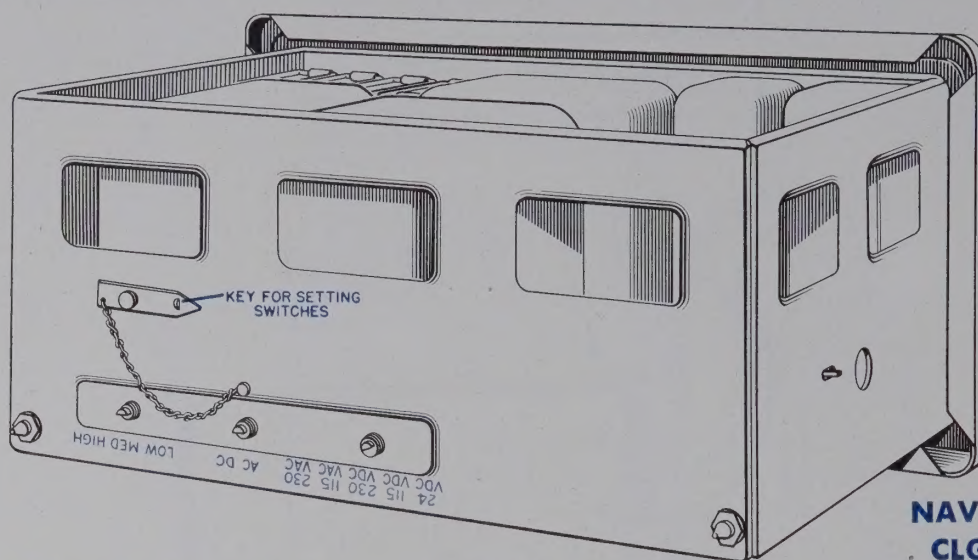
To connect the transmitter-receiver and the modulator-dynamotor units there are furnished two cables, both two feet long fitted with connectors on the ends. One cable consists of three wires, the other nine wires. These cables are plugged into the receptacles in the panels of the units as shown in the illustration.

For connection to the Universal Power Unit an eight-foot-long, 9-conductor cable is provided that plugs into a receptacle on the modulator-dynamotor panel and into the receptacle marked output on the universal power unit panel.

For connection to the power supply mains on ship-board, loose plugs are furnished that are to be fitted to the end of a supply cable, for plugging into the power supply receptacle on the power unit.

The other end of the cable connects to nearest power supply outlet.

ADJUSTING AND TUNING THE EQUIPMENT



POWER UNIT SETTINGS

After mounting and fastening the power supply unit it will be necessary to set the switches to adapt the unit to the power available.

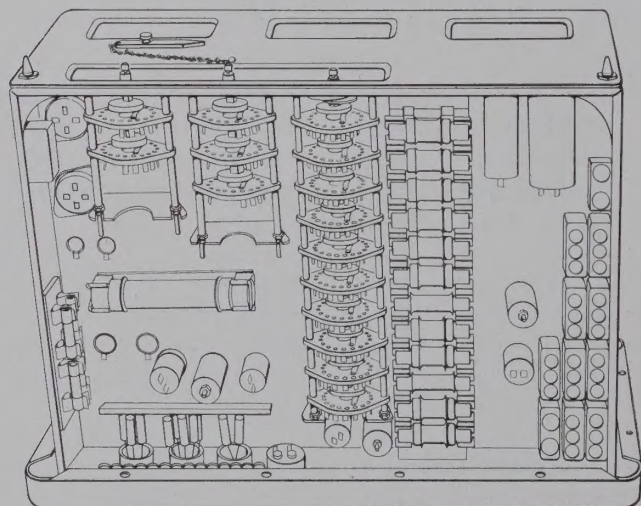
NOTE:—Determine voltage and characteristic of power source. Should plate on front of unit indicate proper setting it will only be necessary to check Hi-Med-Low switch for voltage variations. To make adjustments, proceed as follows:

Disconnect any cables connecting to power unit and loosen the clamping thumbscrews on the front panel that hold chassis in case. Pull power unit chassis forward to point where latches prevent its further removal. Then, pressing thumb of both

hands against latch spring accessible through the holes on the sides of the case, release latches and withdraw chassis from case.

The three switches on the rear of the chassis, as shown in illustration above, are set in the following manner:

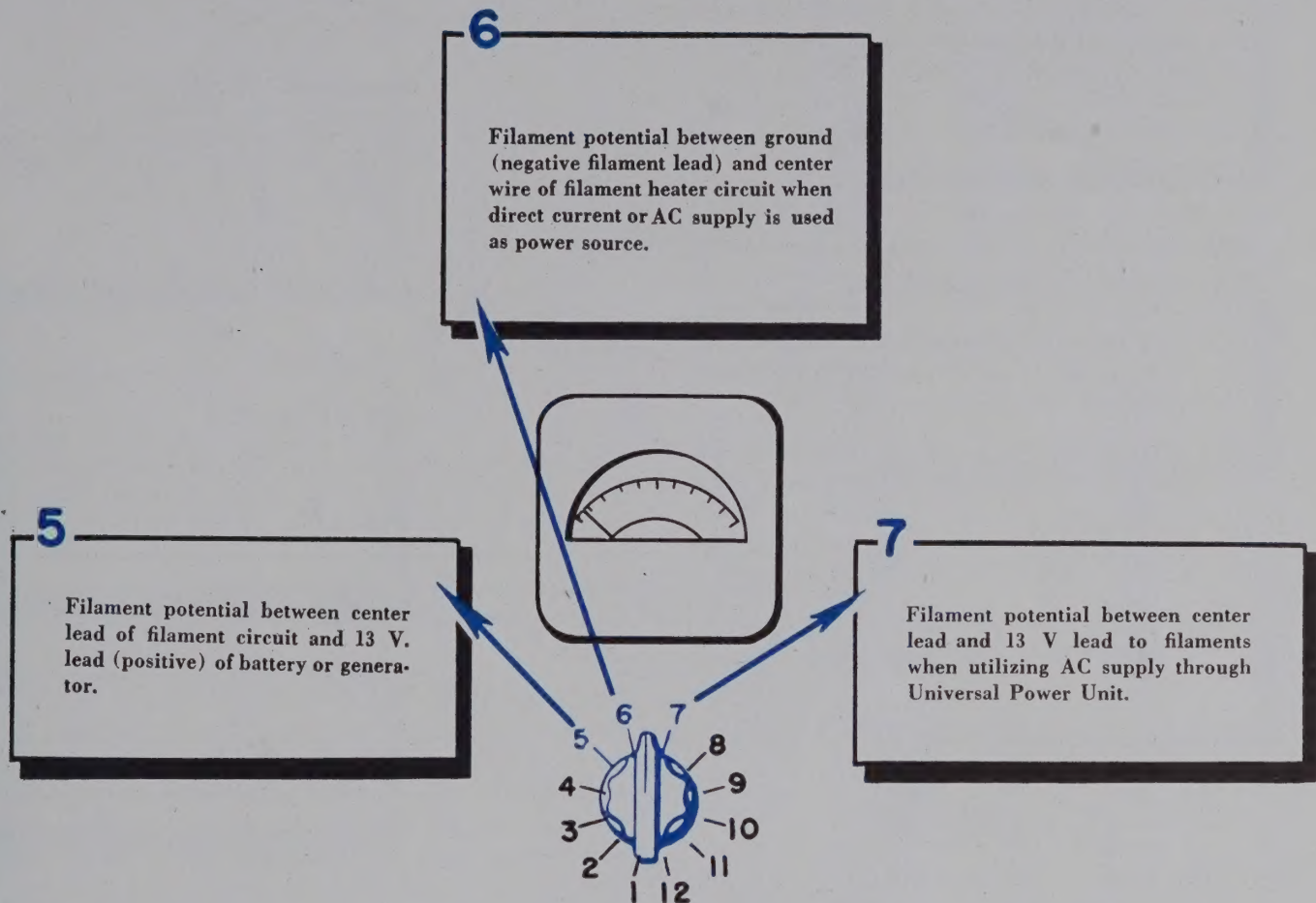
- 1** Remove the switch lever from the back panel and set in place on the extended shaft of the main power switch. This switch is clearly marked with the input voltages. Turn the switch lever until the indicating point lines up with the desired input voltage.
- 2** Move the switch lever to the shaft of the switch marked "AC-DC." Set this switch to correspond to the type of input voltage available.
- 3** Move the switch lever to the shaft of the switch marked "Hi, Med, Low." If the input voltage does not vary more than 5% from the nominal voltage, set the switch to the position marked "Med." Refer to input variation chart.



INPUT VOLTAGE VARIATION CHART

	Above 27.5	Above 121	Above 242	Above 121	Above 242
HIGH					
MED.	26 VDC ±5%	115 VDC ±5%	230 VDC ±5%	115 VAC ±5%	230 VAC ±5%
LOW	Below 24.5	Below 109	Below 218	Below 109	Below 218

BALANCING THE TUBE HEATER CIRCUIT



Many of the tubes in the equipment operate on a 6.3 volt filament or heater current. In order to operate these on a 13 volt supply, they must be connected in series across the filament supply lines. Since the current consumption of the tubes varies, it has been necessary to connect the filaments in paralleled groups, with these groups connected in series, to get proper balancing of the filament voltages as shown in the illustration.

Slight differences in the filaments or heater resistances well within manufacturing tolerances may result in an unbalanced condition in these circuits. It has been necessary to provide a variable resistor R722 and a transfer link S704, which connects the resistor across one or the other of the two branches, in the filament circuit, so the load in the branches may be balanced and the voltages equalized.

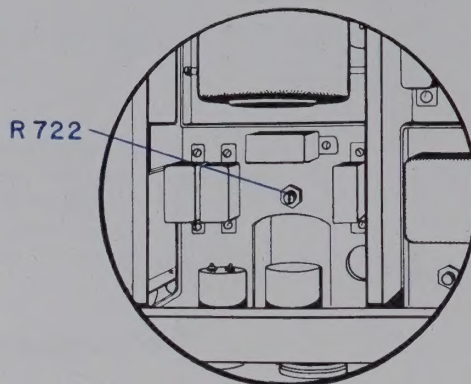
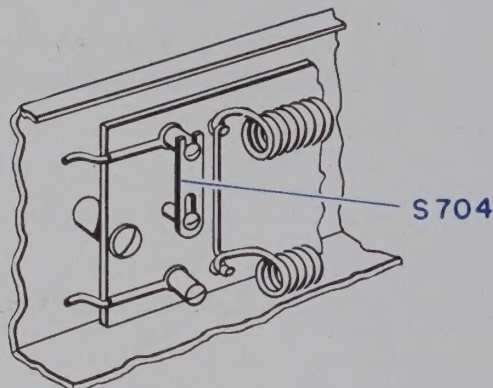
The voltage across the two branches of the split filament supply circuit thus formed may be readily checked by means of the meter and meter switch on the transmitter panel. When operating on a 13-volt direct current source, with power switched on the equipment, the meter switch should be moved to positions 5 and 6 successively. The readings at both these settings should be 7.5.

A difference in the readings indicates an unbalanced filament circuit. Before correcting the unbalanced condition it is well to check the filament rheostat setting to determine if the total voltage applied to the filament circuit is correct. The sum of the meter readings obtained on settings 5 and 6 should be 15. Should it be other than this, adjust the filament rheostat on the panel of the modulator unit till the sum of the voltages of the two readings is 15.

To balance the circuit, shut off the power to the equipment and loosen screws holding modulator chassis in case. Withdraw case till it is possible to reach the resistor R722 with a screwdriver. Switch on power to equipment and adjust R722 till a reading of 7.5 is obtained with meter switch in both positions 5 and 6.

Should it be impossible to obtain a balance with any setting of the resistor, cut off power once more and move link S704 to the other terminal as shown in the illustration. Now switch on the power and a setting will be found on R722 that will give a perfect balance.

BENEATH THE CHASSIS



ON TOP OF CHASSIS

The modulator chassis may be shoved back into the case and the panel screws replaced. It is not likely that any further adjustment of the filament circuits will be necessary unless a number of tubes are changed. A check can be kept on this condition by means of the meter on the transmitter panel.

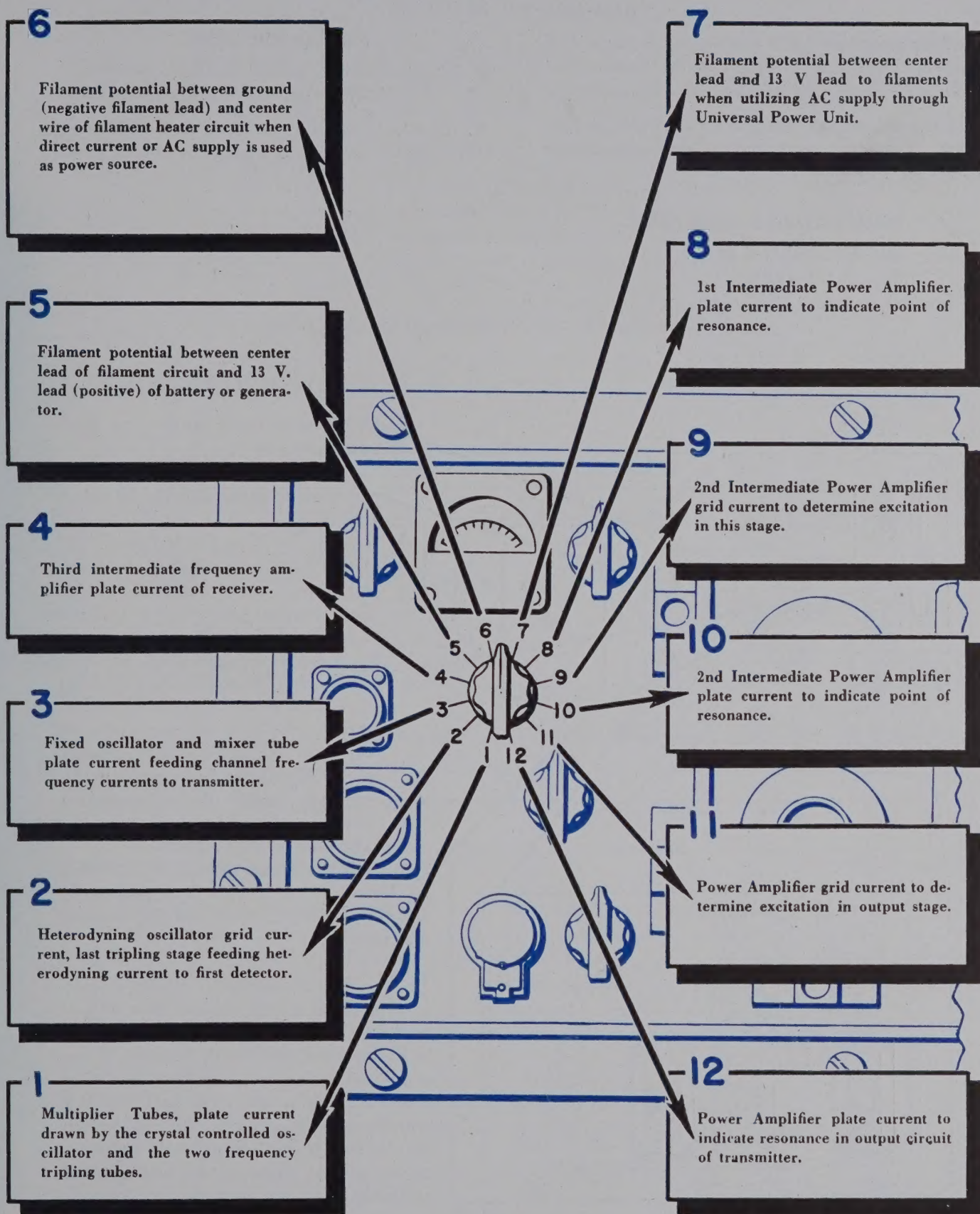
When operating from a shipboard supply, where the universal power unit is used with the equipment, the filaments are operated on alternating current. The checking and adjustment of the filament circuits in this case is exactly the same as given above with the exception that positions 6 and 7 of the meter switch are used as indicated in the chart. The alternating current supply to the filament requires the use of a rectifier when taking readings with the direct current meter on the equipment. One section of the double diode V401 in the audio frequency section being utilized for the purpose.

TUNING RADIO EQUIPMENT

The equipment is shipped with both transmitter and receiver tuned to the frequency channels as determined by the crystal oven furnished. Ordinarily, there is no need to make tuning adjustments when installation is completed beyond such switch settings in the power supply as may be required

to adapt it to the power source available. The following instruction apply where repairs or replacements have been made that interfere with settings or when a change of channel frequencies is desired.

SELECTOR SWITCH SETTINGS



ADJUSTING RECEIVER

PRELIMINARY SETTINGS

Remove secondary panel covering the selector dials and crystal oven at the right of the Transmitter-Receiver by loosening screws around edge of panel.

Make certain crystal oven is fitted tightly in jack plate. Note, knob and adjustable pilot light cover comes off with panel.

TRANSMITTER-RECEIVER PANEL

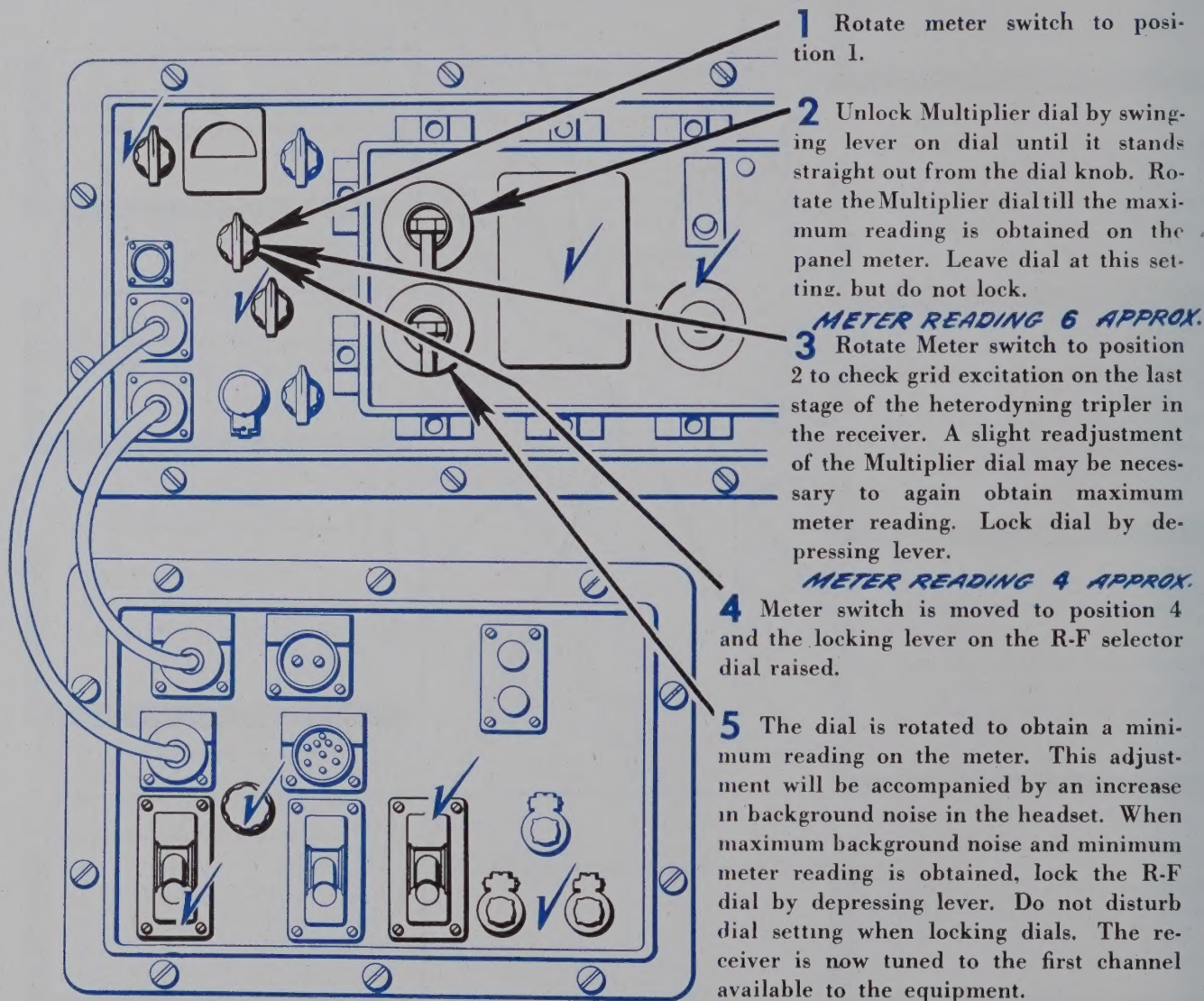
- ✓ Set—Output Level at 5 or 6.
Silence Level at 0.

- ✓ Place Channel Selector switch on position 1.

MODULATOR PANEL

- ✓ Place—IC-Radio switch in Radio position.
MCW-Phone switch in Phone position.
- ✓ Insert microphone extension cord with press-to-talk switch and headset plugs in proper jacks.

TUNING SEQUENCE



ADJUSTING TRANSMITTER

1 The MCW-Phone switch is placed at midpoint or Tune position and the meter switch is moved to position 8. Unlock the 1st IPA selector dial and, with the press-to-talk switch held closed, rotate the dial till a sudden dip in the meter reading indicates the resonance point of the circuit. Leave dial unlocked.

**METER READINGS
ARE OBTAINED
WITH MCW-PHONE
SWITCH IN
PHONE POSITION**

To check above adjustment, with press-to-talk switch closed, press Frequency Test switch to right of pilot light on panel. This renders the fixed oscillator inoperative and there should be a sudden increase in the meter reading. Should there be no increase, retune the 1st IPA dial for another point of minimum current. Check the latter setting with the frequency test control and if it checks correctly then the 1st IPA dial should be locked. **METER READING 6 APPROX.**

2 Move meter switch to position 9 and unlock 2nd IPA dial. With the press-to-talk switch depressed, adjust dial to obtain maximum reading on the meter to indicate maximum excitation on this power stage. Leave dial unlocked. **METER READING 7 APPROX.**

3 Move meter switch to position 10. Move 2nd IPA dial slightly to check if the meter reading can be reduced and lock the dial at the lowest meter reading. **METER READING 2.5 APPROX.**

4 Place the meter switch on position 11 and unlock the PA dial. Adjust the dial to obtain maximum reading on the meter, with press-to-talk switch closed. **METER READING 8 APPROX.**

5 Move the meter switch to position 12 and with Ant. dial at zero, readjust the PA dial slightly to obtain minimum meter reading. Unlock Ant. dial and increase coupling until a meter reading of **4.5** is obtained. Adjust PA dial to reduce the reading if possible and repeat this sequence until **4.5** is obtained as lowest point of PA reading then lock dial.

6 Return meter switch to position 11 and unlock and retune 2nd IPA dial to obtain maximum excitation on the PA grid. This dial can then be locked.

This completes the tuning of the receiver and transmitter for one channel.

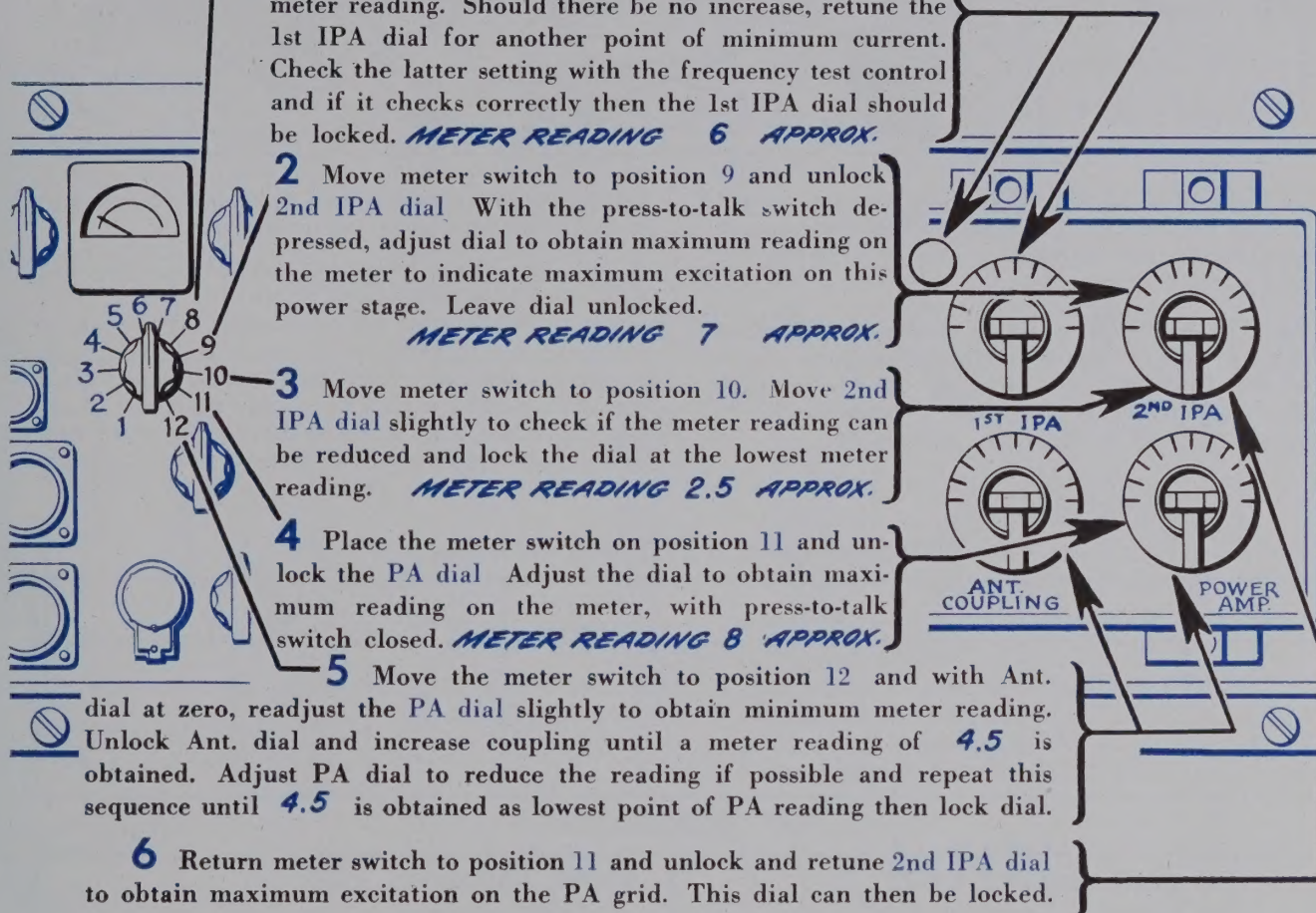
To tune for the second channel, move the channel selector switch to position 2 and all the selector dials will revolve automatically to the proper position for adjustment to the second channel frequency.

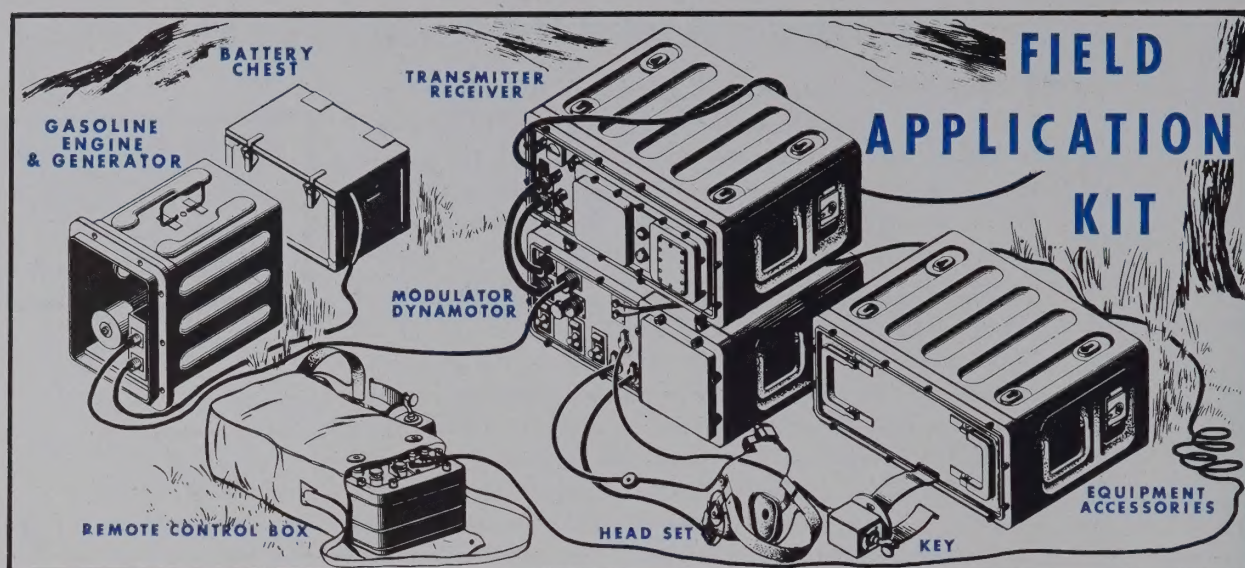
The tuning sequence for both receiver and transmitter is repeated step by step to adjust the equipment for the second channel frequency. Unlocking the dials for the tuning procedure does not disturb previous settings.

The remaining eight channel frequencies are pre-tuned in the same manner.

Note—Do not change setting of channel selector switch with dials unlocked as all previous settings of dials will be deranged and the tuning procedure must be repeated on all frequencies previously set.

When the cover is replaced, the selector switch knob should be rotated slowly till the spring pin in the coupling plate to the switch engages in the hole in the plate attached to the knob. The switch and knob will then operate in unison.





The basic units of the MAR radio equipment are adapted for use in the field by the addition of units that permit its operation in isolated regions and by remote control.

The primary power source consists of a gasoline engine driven 13V d-c generator mounted on a base and fitted into a metal carrying case. A two-wire cable 25 feet long is furnished to connect the engine driven unit to the radio equipment.

A storage battery case is also furnished when

transportation permits, and a cable furnished to connect battery box to generator unit.

A remote control box, in a canvas carrying bag with operating accessories, is also furnished. This permits operation of the equipment over a pair of telephone wires for any distance up to one mile. A special antenna clamp and accessories are furnished for field use. The clamp is of the chain type with a clamp member held by a wing nut. The chain permits the clamp being quickly attached to a tree or other elevated structure.

COMPONENTS OF FIELD APPLICATION KIT

QTY.	NAVY TYPE	UNIT	WIDTH INCHES	DEPTH INCHES	HEIGHT INCHES	WEIGHT LBS
1		Gas Engine driven generator	11 ³ / ₄	18 ³ / ₄	14 ³ / ₄	35
1	CRF-10402	Battery Chest with 2-CRF-19017 Batteries	23	16 ³ / ₄	14 ³ / ₄	
1		Accessory Box	21	16	9	
1	CRV-23485	Remote control unit	7 ¹ / ₄	7	5	4

KIT ACCESSORIES

WITH GAS ENGINE UNIT

- 1 Gas Engine to modulator cable
- 1 Set gas engine operating spares

ACCESSORIES

- 1 50 ft. antenna cable with plugs
- 1 Battery interconnecting cable
- 1 Telegraph knee clamp
- 2 Pairs cabinet attachments
- 12 Silica Gel dryer cartridges

WITH ANTENNA CASE

- 1 Chain clamp
- 1 Wrench
- 1 10 ft. antenna cable with plugs

WITH REMOTE BOX IN CANVAS CASE

- 1 Headset and cord
- 1 Telegraph key with knee clamp
- 1 Microphone
- 1 Microphone extension cord

BASIC MAR EQUIPMENT FURNISHED WITH FIELD KIT

QUAN.	NAVY TYPE	UNIT	WIDTH INCHES	DEPTH INCHES	HEIGHT INCHES	WEIGHT POUNDS
1	CRV-43067	Transmitter-Receiver	21	16	9	45
1	CRV-50248	Modulator-Dynamotor	21	16	9	45
1	CRV-20379	Universal Power Supply	21	16	17 ³ / ₈	100
1	CRV-66147	Antenna		25	22	3 ¹ / ₂

ACCESSORIES FURNISHED WITH BASIC MAR EQUIPMENT

In Modulator-Dynamotor compartment

- 1 set of operating spare tube—1 of each type used
- 1 Headset
- 1 Headset extension cord
- 1 Lip microphone
- 1 Microphone extension cord
- 1 Telegraph key without knee clamp

ACCESSORIES

- 2 Interconnecting cables
- 1 Battery cable, with clips
- 1 Power cable from power unit
- 1 Set operating spares, less tubes
- 2 Plugs for input to power unit

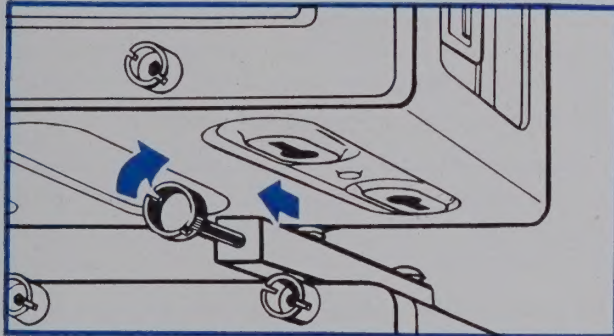
WITH ANTENNA

- 1 Shipboard clamp
- 2 Transmission line connectors
- 1 Coupling adapter unit

ASSEMBLING MAJOR UNITS FOR OPERATION

The assembling of the equipment for use in the field is accomplished by clamping the two radio units together, attaching the antenna to the nearest support by the chain clamp, interconnecting the equipment and available power supply.

The transmitter-receiver unit can be mounted on the modulator-dynamotor as shown in the illustration on the opposite page by means of the two



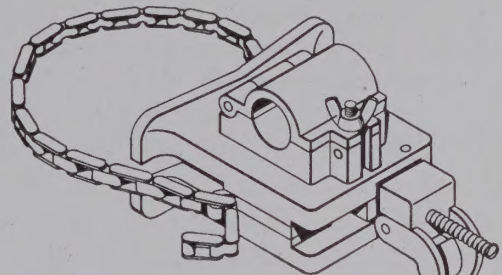
cabinet fasteners provided. Turn the knobs on the ends of the fasteners to the left until the sliding studs on the sides of the fasteners will drop freely into the holes in the keyhole slots on the top of the modulator-dynamotor case. Now lift the transmitter-receiver case and place the case so the holes in the keyhole slots fit over the studs on the fasteners as shown in the small illustration above.

Pull out the knobs of the fasteners, which have sliding stems for this purpose, and turn the knobs to the right, causing the studs to slide into the slots in the holes in both the cases.

The covers may now be removed from the units by means of wrenches clipped to the ends to expose the panels and cable connectors. The two short cables provided for the purpose are attached to the proper receptacles on the panels.

The antenna is erected by means of the chain clamp shown below. The chain is fitted around any high support, tree, pole or other object within 50

feet of the equipment, and the free end is slipped over the hook on the side of the clamp. Turning the hinged handle will then fasten the clamp securely in place.



The wing nut on the small clamp on the side is released, the hinged cap swung back, and the shank of the antenna inserted with insulated rod toward the ground. Swing the hinged member over the antenna and tighten the wing nut to clamp the antenna assembly in place. The 50-foot antenna transmission line can then be connected between antenna fitting and radio equipment receptacle.

The gas engine unit is then prepared for operation by removing it from the case. If it is being used for the first time, make certain that all waterproofing materials and protection are removed from this unit so as not to interfere with operation. Connect the 25-foot cable to upper right-hand receptacle of modulator-dynamotor unit and to a receptacle on the gas engine unit.

The battery can be connected to the gas engine unit by means of the 5-foot cable fitted with spring clips. Make certain the red-sheathed clip is connected to the positive terminal of the battery and the black-sheathed clip to the negative. A short cable is provided to connect the two cells in the battery chest together and should be installed if not already in place.

REMOTE CONTROL BOX CONNECTIONS

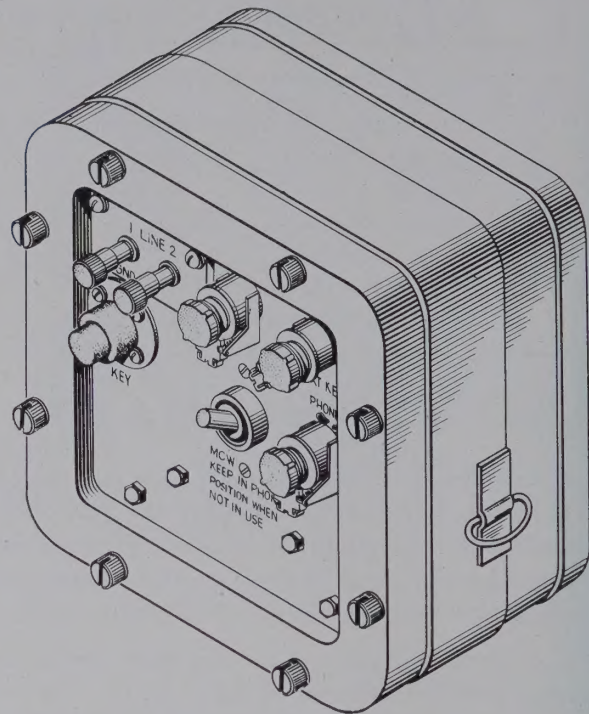
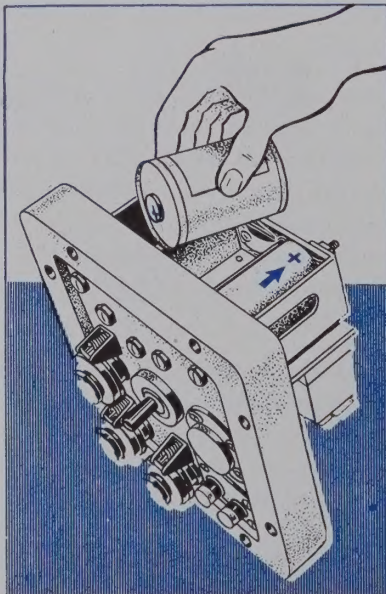
Before the Remote Box can be put into service, it will be necessary to install the three small dry cells used as a local battery at the control box. This is done by loosening the eight screws on the outer rim of the panel and withdrawing the panel from the case.

At one side of the assembly on the rear of the panel will be noted the three small compartments for clipping in the batteries. When inserting the batteries, as shown in the illustration, make certain the positive or center terminal of the cell is placed to conform with the indications stenciled in the bottom of the case.

With the batteries properly placed, the panel can be attached to the case again, by means of the screws previously loosened. Make certain the panel fits snugly and a watertight seal is obtained at the rubber gasketed joint between panel and case.

The remote box is connected to the radio equipment by a two-conductor flexible cord, twisted telephone wires or other equivalent electrical means. It is important that similarly marked terminals on the line terminal block on the modulator-dynamotor and on the remote box be connected together.

When operating accessories are connected to the proper jacks, the installation should be ready for operation. The equipment may be switched on



and put into operation on the storage battery at once and the engine unit started as soon as convenient. The battery floats across the generator line and will keep the equipment operating should the engine shut down for any cause.

Operation of the equipment can then be checked in the following manner. With the radio equipment switched on, place the meter selector switch on position 12.

Depressing the press-to-talk button on either microphone extension cord should result in a meter indication of approximately 4.5. This checks the operation of all switching relays, and the transmitter is in operation.

Placing the IC-Phone switch on the modulator panel in IC position should permit conversation between the radio equipment operator and the remote box operator to check speech input to the equipment.

Move the MCW-Phone switch on the remote box panel to the MCW position. This will put the hummer in the remote box into operation. Pressing the key on the remote box will result in the modulating note generated by the hummer being heard at the radio equipment, indicating proper operation of the MCW circuits in the remote box. Return switch on remote box to phone position.

Return the IC-Phone switch on modulator-dynamotor panel to phone position and the installation should be ready for operation.

INSTALLATION REFERENCE DRAWINGS AND DATA

NOTE

THE FOLLOWING PAGES PROVIDE
COMPLETE, CONDENSED INFORMATION
PERTINENT TO THE INSTALLATION
OF MAR EQUIPMENT.

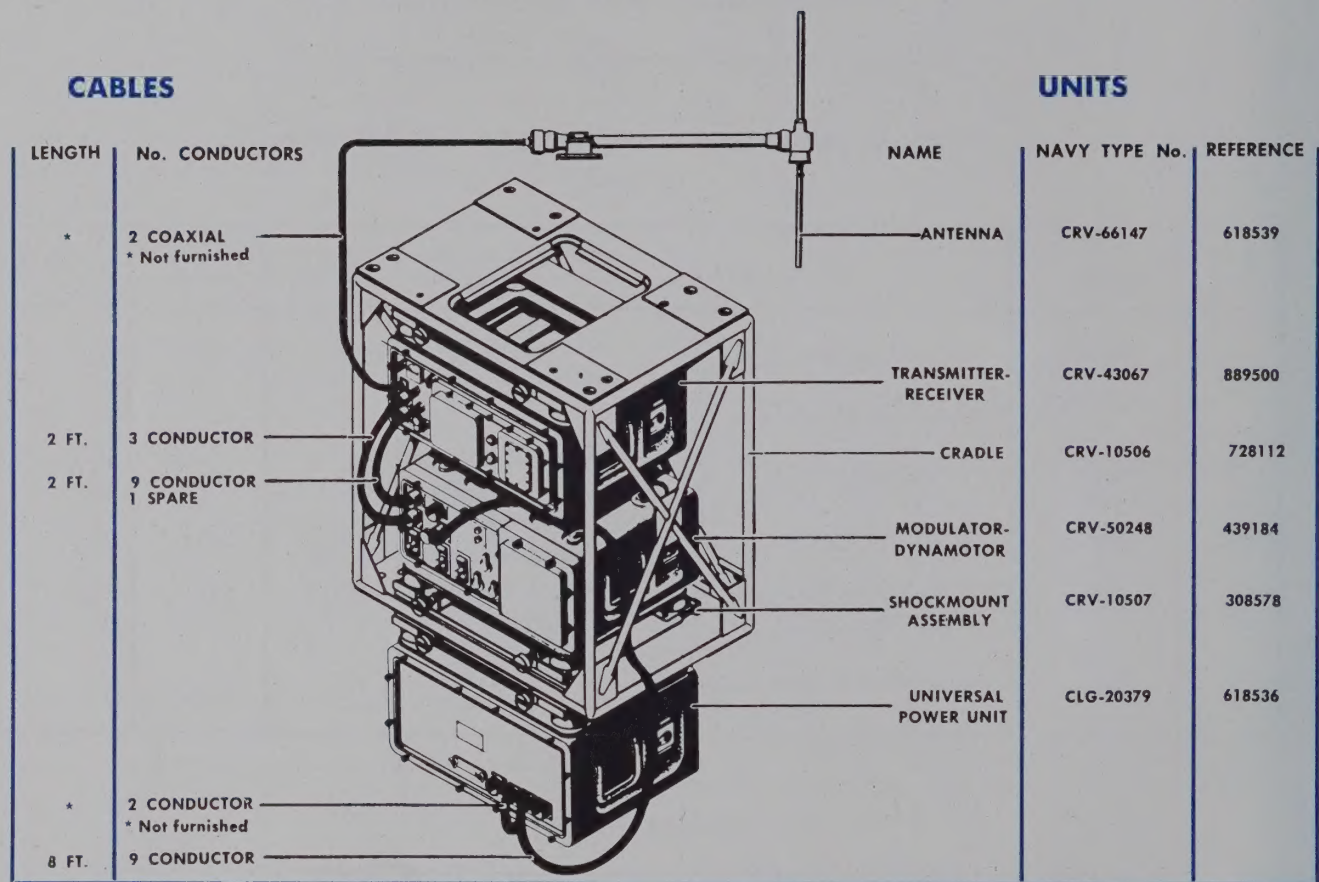
TYPICAL SHIPMENT — SHIPBOARD EQUIPMENT Crated

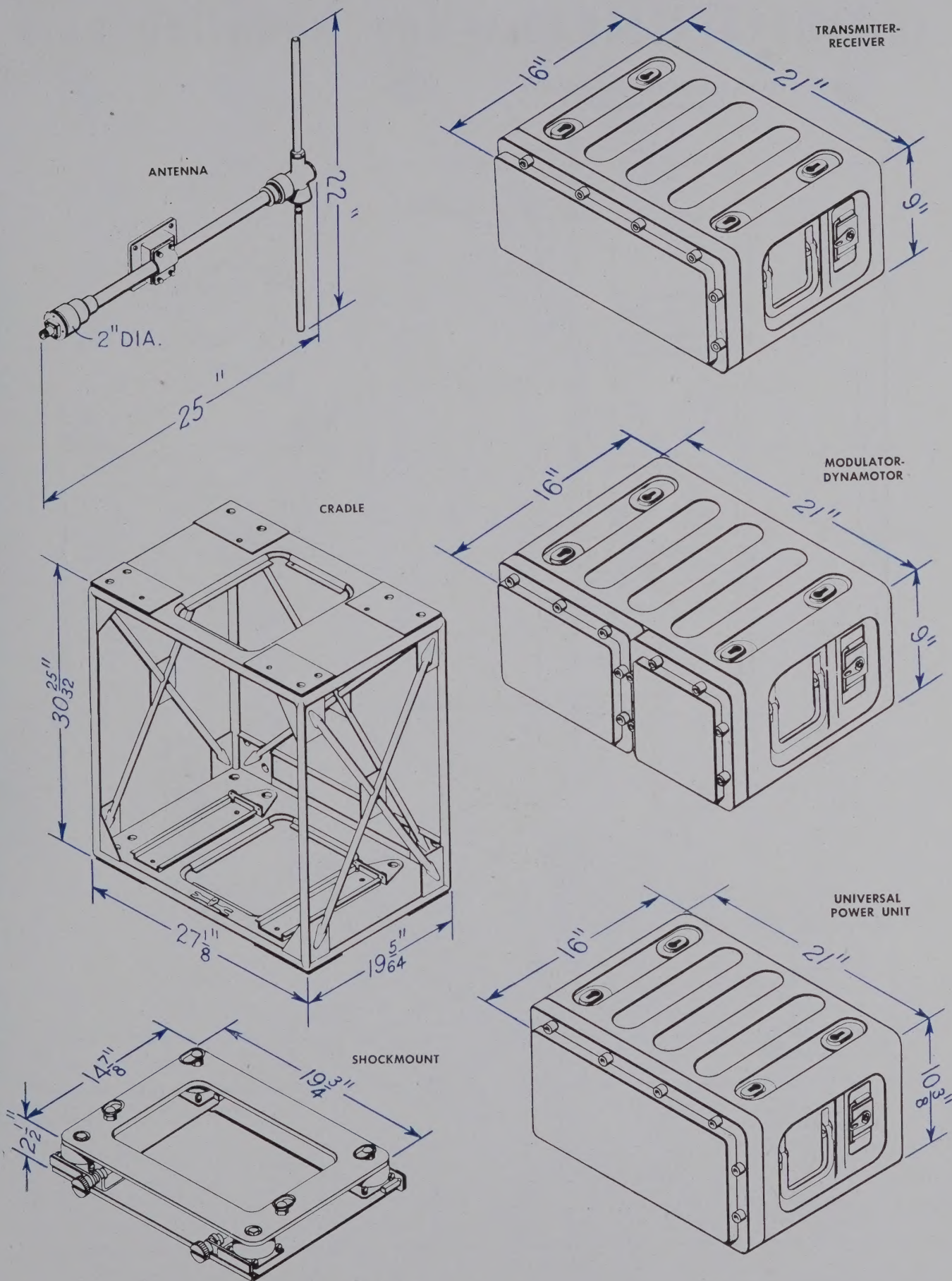
CASE NO.	UNIT	CONTENTS	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	VOL. CU. FT.
1	Basic	Transmitter-Receiver Modulator-Dynamotor	27½	25	22	8.8
2	Basic	Power Supply Unit	26½	19	15	4.4
3	Kit	Cradle Assembly	41	30½	22½	16
4	Kit	Shockmount Junction Box Accessories	20	15½	14½	2.2
5	Kit	Antenna and Accessories	31	19½	11½	4

SPARE PARTS

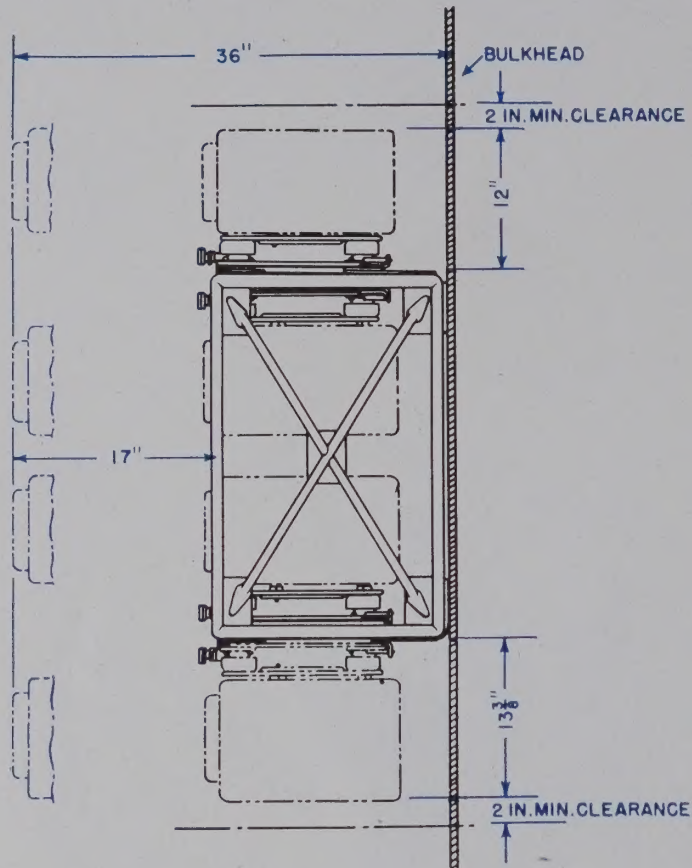
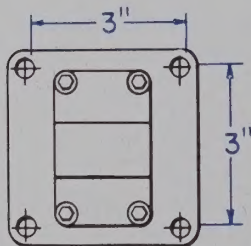
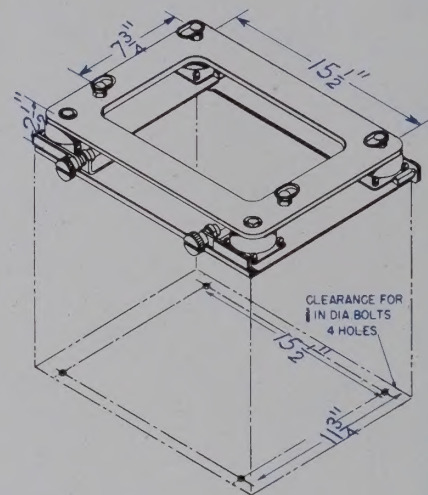
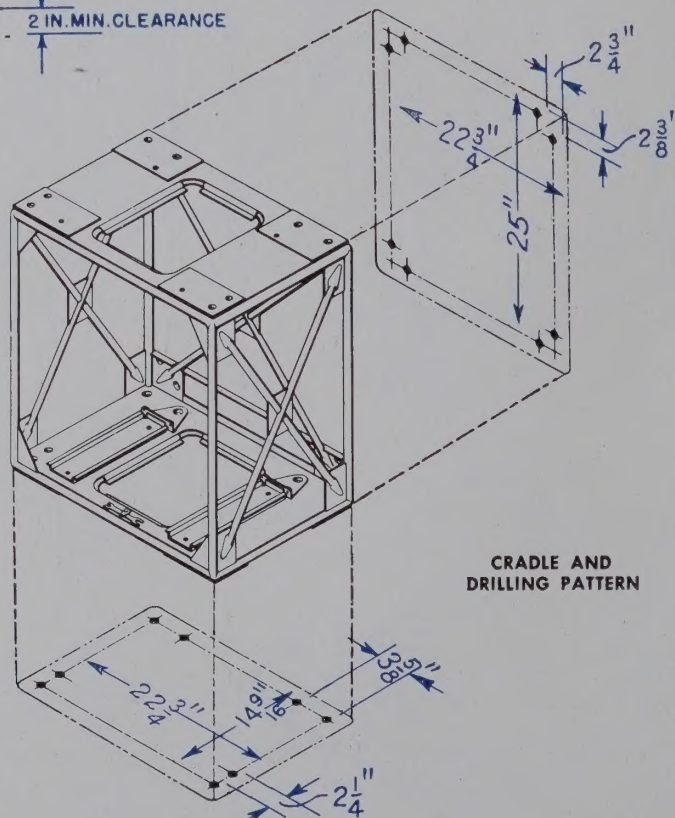
BOXES	TYPE	LENGTH INCHES	WIDTH INCHES	DEPTH INCHES	VOL. CU. FT.
2	Equipment	36	18	18	6.75
3	Tender	36	18	18	6.75
	Stock	Assorted Boxes			

MAR SHIPBOARD INSTALLATION DATA

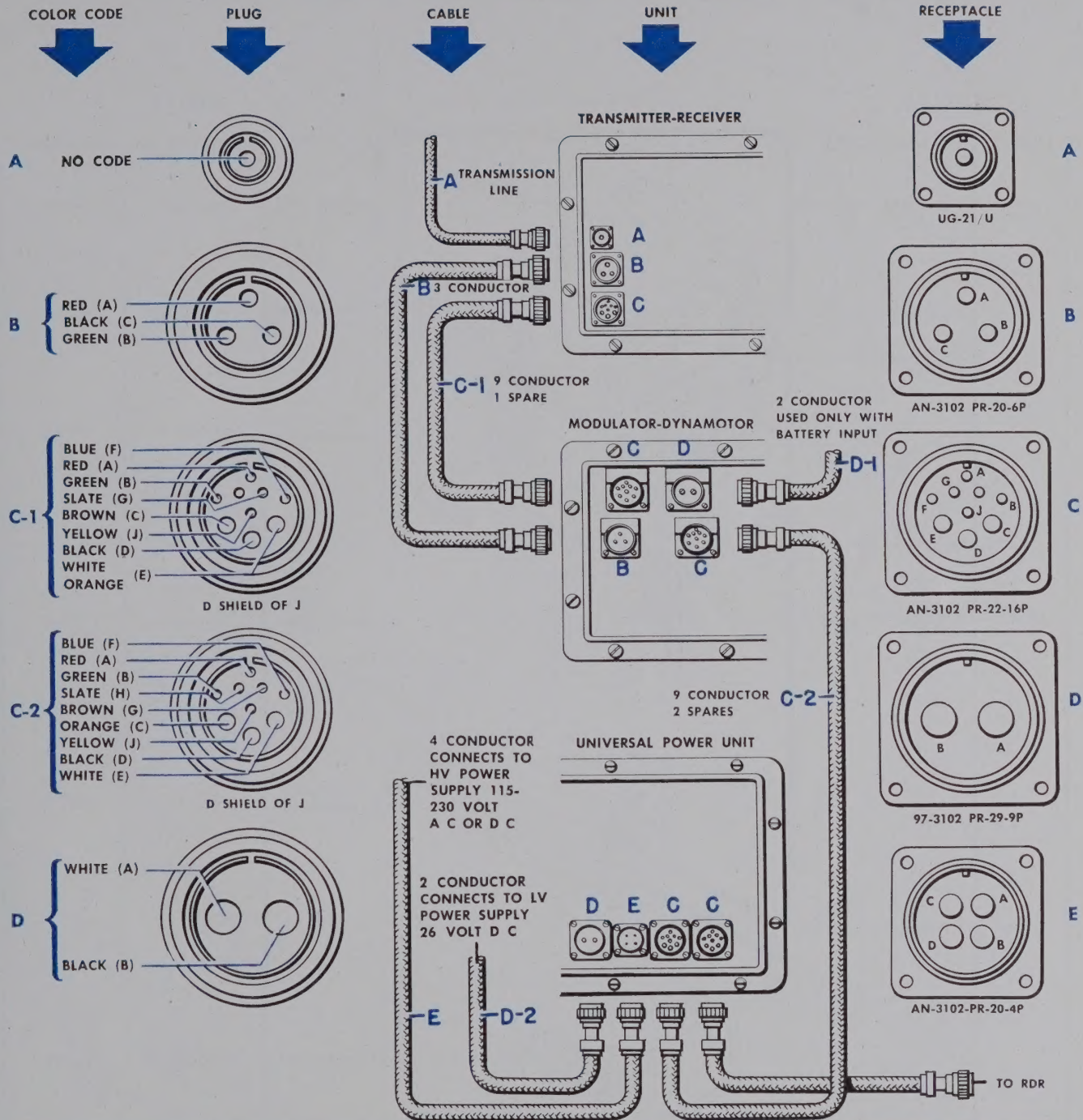




SHIPBOARD CLEARANCE AND MOUNTING DATA

CRADLE AND SHOCKMOUNT ASSEMBLY
INSTALLATION CLEARANCESSHOCKMOUNT ASSEMBLY
AND DRILLING PATTERNANTENNA CLAMP
DRILLING PATTERNCRADLE AND
DRILLING PATTERN

SHIPBOARD INTERCONNECTION DATA



CABLE CHARACTERISTICS	A	B	C1	C2	D1	D2	E
Navy Type No.	*	62222	62224	62225	62223	*	*
Mfg's Reference	*	722626	722625	722625	722658	*	*
Length in feet	*	2	2	8	5	*	*
Furnished	Plugs Only	Complete	Complete	Complete	Complete	Plugs Only	Plugs Only

* Not Furnished

MAR FIELD INSTALLATION DATA

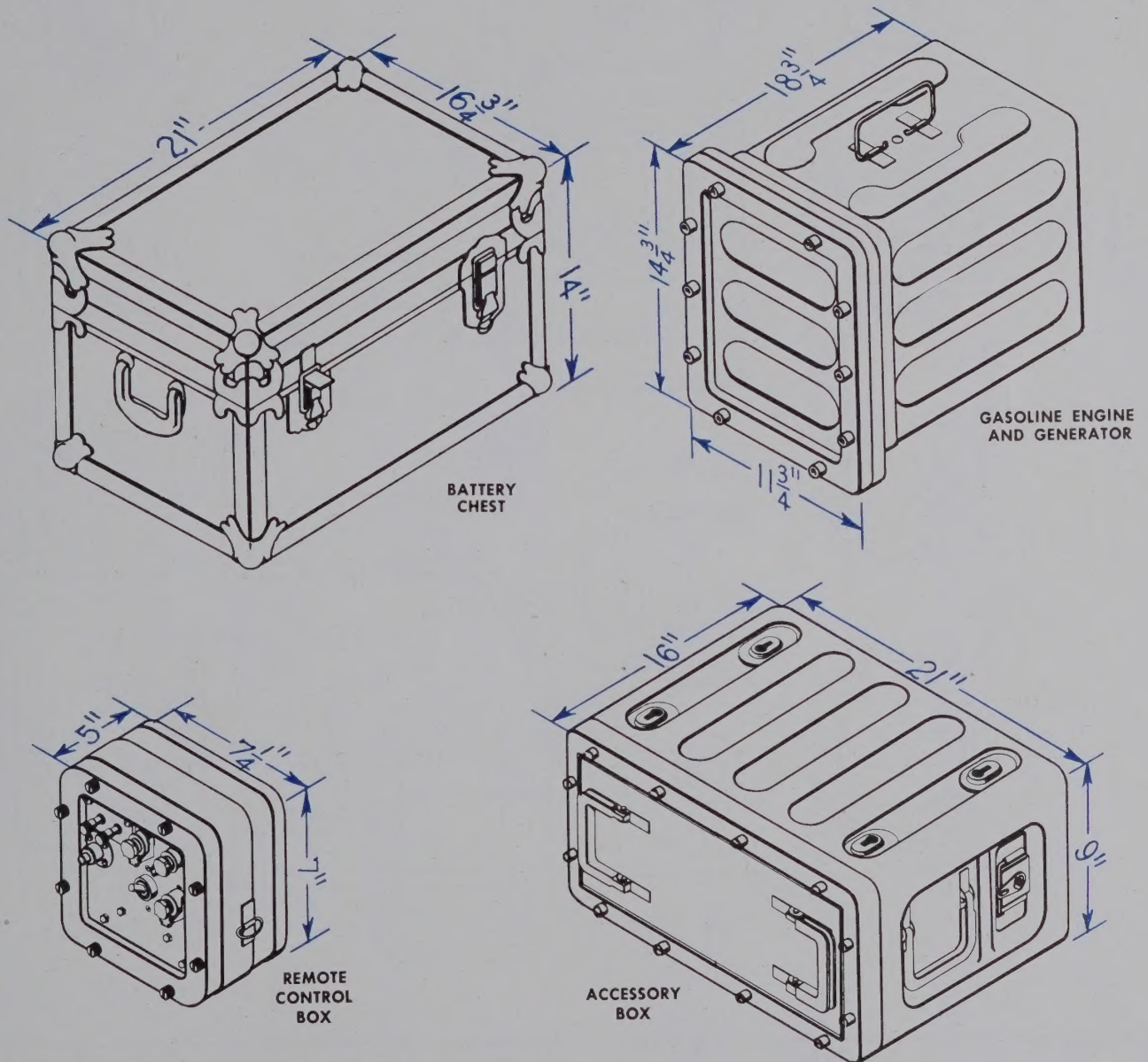
CABLES

UNITS

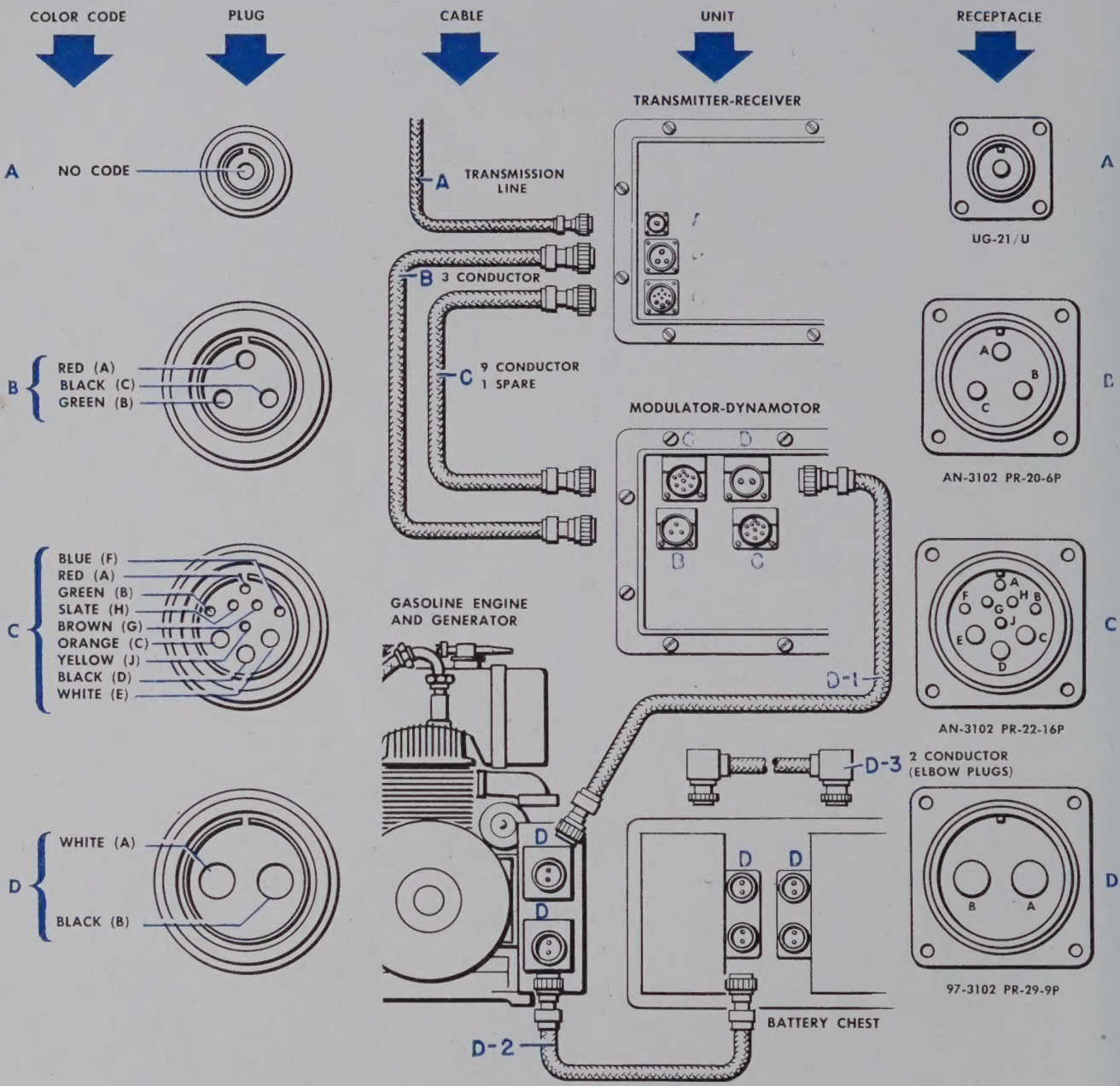
LENGTH	No. CONDUCTORS	NAME	NAVY TYPE No	REFERENCE
10 FT. 50 FT.	2 COAXIAL	ANTENNA	CRV-66147	618539
2 FT.	3 CONDUCTOR	TRANSMITTER-RECEIVER	CRV-43067	889500
2 FT.	9 CONDUCTOR 1 SPARE	MODULATOR-DYNAMOTOR	CRV-50248	439184
*	TWISTED PAIR			
25 FT.	2 CONDUCTOR	REMOTE CONTROL	CRV-23485	719696
		GASOLINE ENGINE DRIVEN GENERATOR	*	308135
5 FT.	2 CONDUCTOR	BATTERY CHEST	CRF-10402 - A	618568
		ACCESSORY BOX	CRV-10485	618586

* Not furnished

NOTE: OVERALL DIMENSIONS OF TRANSMITTER - RECEIVER AND MODULATOR-DYNAMOTOR UNITS SAME AS GIVEN WITH SHIPBOARD DATA.

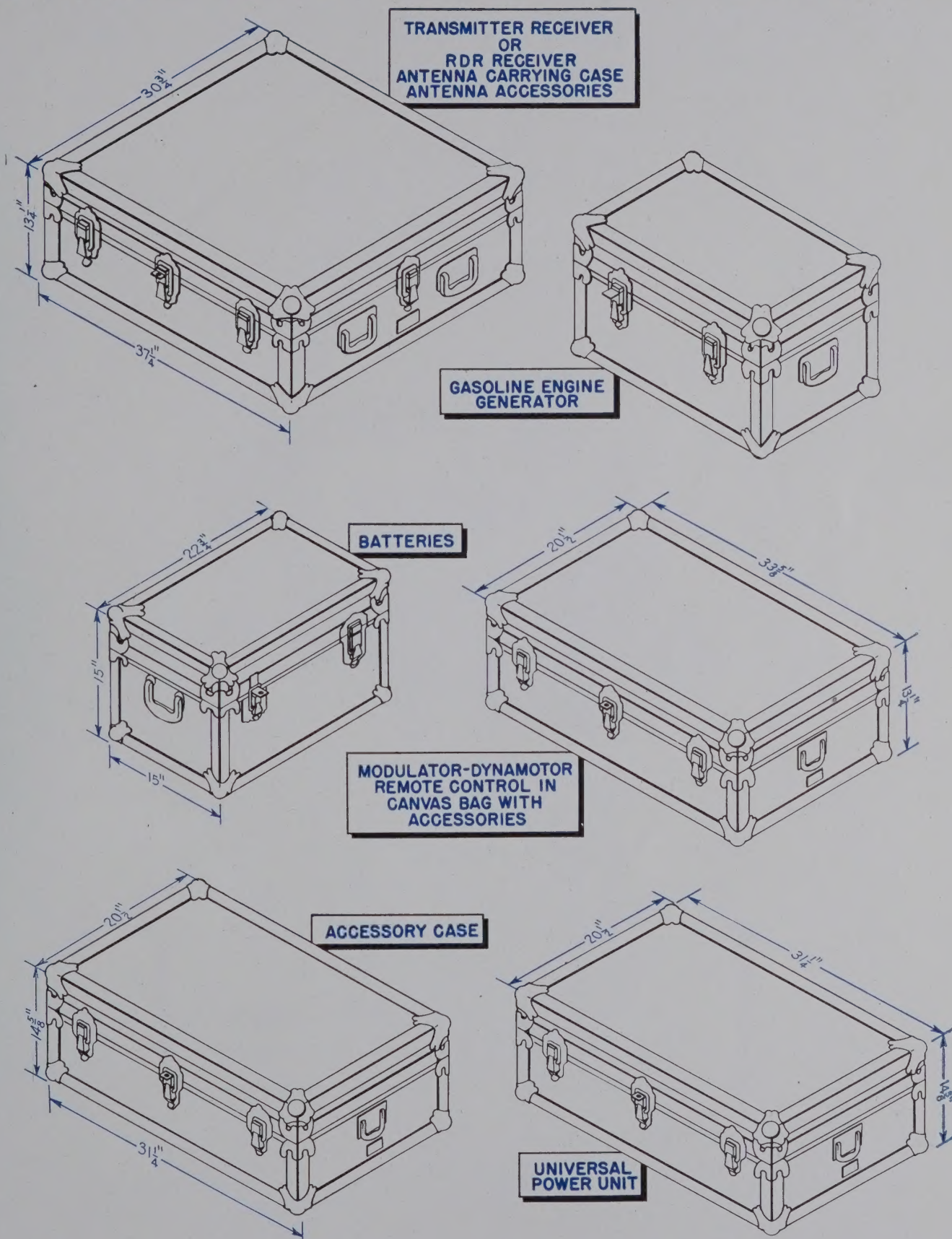


FIELD INTERCONNECTION DATA



CABLE CHARACTERISTICS	A	B	C	D1	D2	D3
Navy Type No.		62222	62224		62223	
Mfg's Reference	722281	722626	722625	722627	722658	439143
Length in feet	10 and 50	2	2	25	5	2
Furnished	Complete	Complete	Complete	Complete	Complete	Complete

LUGGAGE CASES FOR MAR FIELD EQUIPMENT



NAVSHIPS 900,719



RESTRICTED

OPERATION

SECTION 4



M-A-R

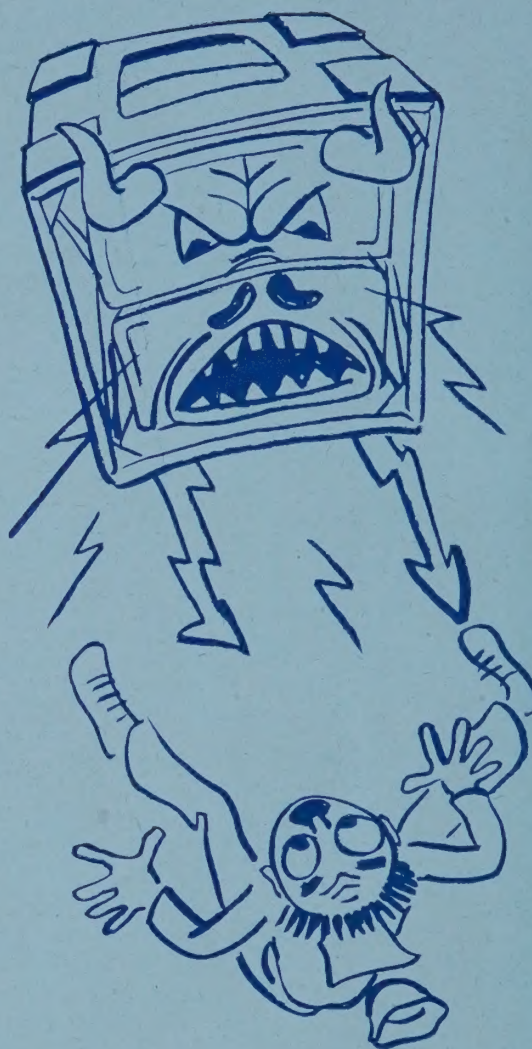
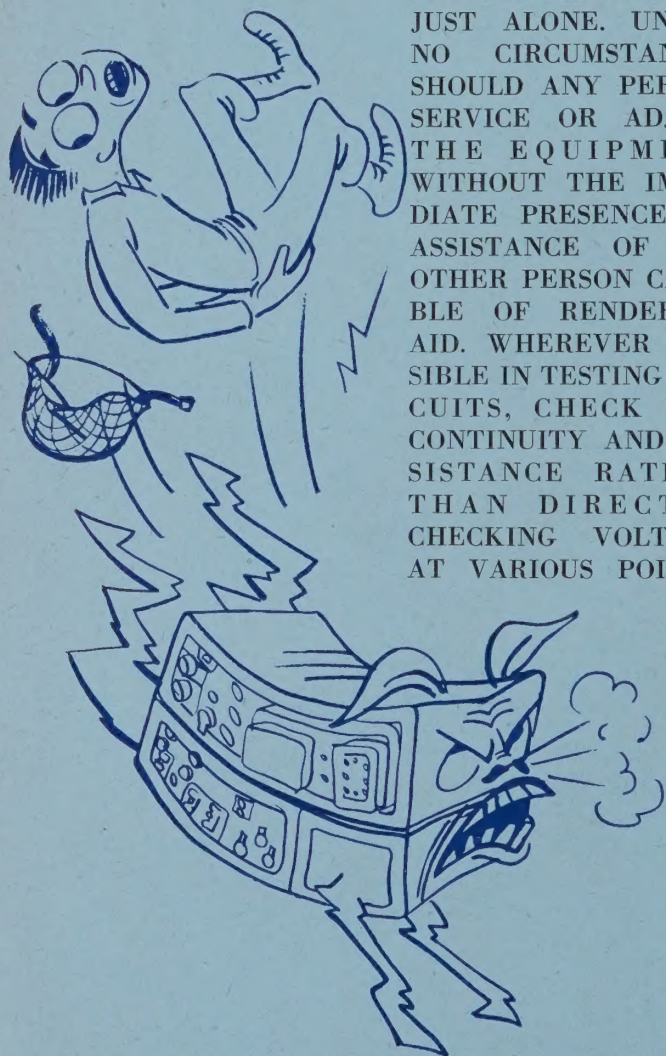
RADIO TRANSMITTING AND
RECEIVING EQUIPMENT

RESTRICTED

SAFETY

THIS EQUIPMENT EMPLOYS VOLTAGES WHICH ARE DANGEROUS AND MAY BE FATAL IF CONTACTED BY OPERATING PERSONNEL. EXTREME CAUTION SHOULD BE EXERCISED WHEN WORKING WITH THE EQUIPMENT. DO NOT CHANGE TUBES OR MAKE ADJUSTMENTS INSIDE THE EQUIPMENT WITH HIGH VOLTAGE SUPPLY ON. DO NOT DEPEND UPON SWITCHES FOR PROTECTION BUT ALWAYS SHUT OFF POWER SUPPLY. UNDER CERTAIN CONDITIONS, DANGEROUS POTENTIALS MAY EXIST IN THE CIRCUITS WITH POWER CONTROLS IN THE OFF POSITION DUE TO CHARGES RETAINED BY CAPACITORS, ETC. TO AVOID CASUALTIES ALWAYS REMOVE POWER DISCHARGE AND GROUND CIRCUITS PRIOR TO TOUCHING THEM.

DON'T SERVICE OR ADJUST ALONE. UNDER NO CIRCUMSTANCES SHOULD ANY PERSON SERVICE OR ADJUST THE EQUIPMENT WITHOUT THE IMMEDIATE PRESENCE OR ASSISTANCE OF ANOTHER PERSON CAPABLE OF RENDERING AID. WHEREVER FEASIBLE IN TESTING CIRCUITS, CHECK FOR CONTINUITY AND RESISTANCE RATHER THAN DIRECTLY CHECKING VOLTAGE AT VARIOUS POINTS.



THE ATTENTION OF OFFICERS, AND OPERATING PERSONNEL IS DIRECTED TO CHAPTER 67 OF BUREAU OF SHIPS OR SUPERSEDING INSTRUCTIONS ON THE SUBJECT OF "RADIO PRECAUTIONS TO BE OBSERVED."

AN APPROVED POSTER ILLUSTRATING THE RULES FOR RESUSCITATION BY THE PRONE PRESSURE METHOD SHALL BE PROMINENTLY DISPLAYED IN EACH RADIO, RADAR OR SONAR ENCLOSURE. POSTERS MAY BE OBTAINED UPON REQUEST TO THE BUREAU OF MEDICINE AND SURGERY.

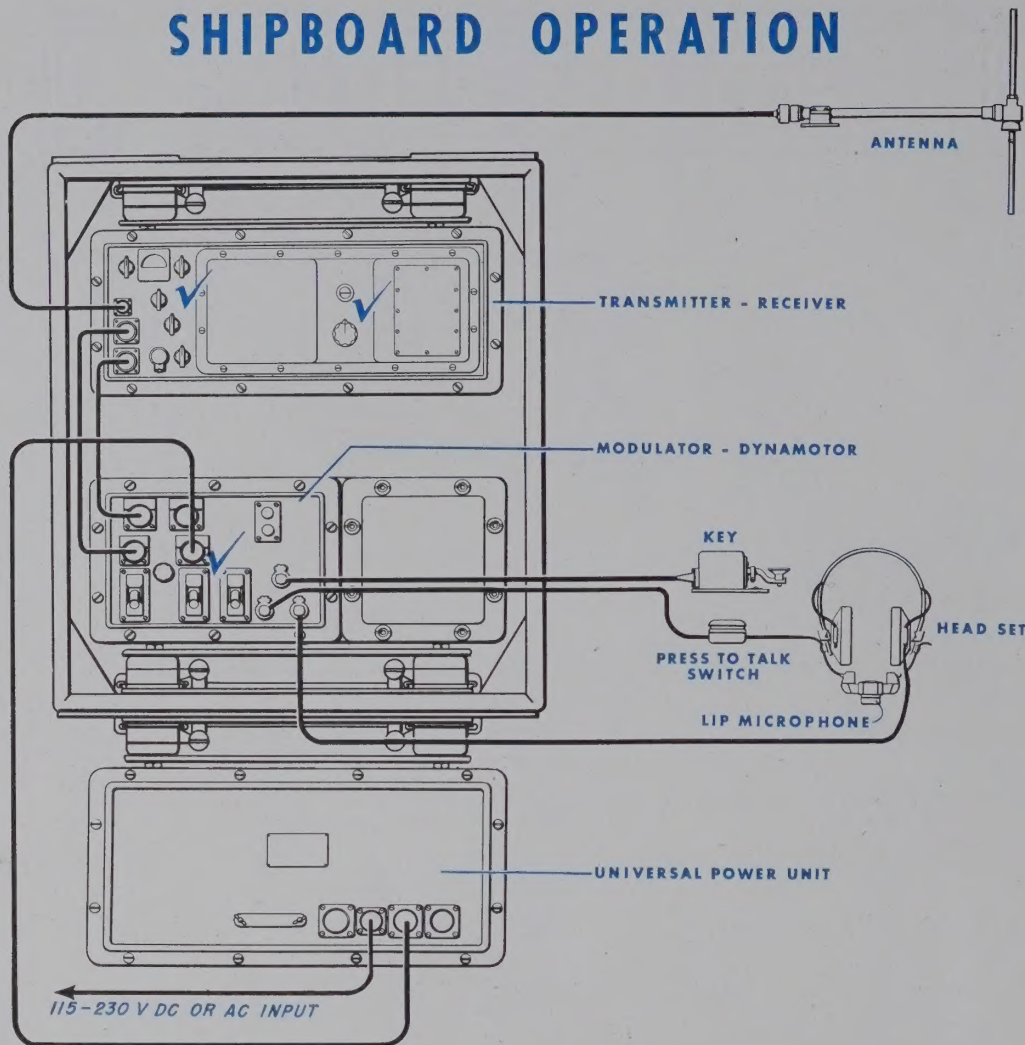
TABLE OF CONTENTS

OPERATION

SECTION 4

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Safety	4-0
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Control Panel Fittings—Transmitter-Receiver	4-4
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Remote Control Panel Fittings	4-7
Operating the Equipment	4-8
Operation at Remote Box	4-9

SHIPBOARD OPERATION



The controls involved in the operation of the shipboard installation are grouped on the panels as shown by blue check marks in the illustration above. A table or shelf to the left of the equipment would be a convenient place to mount the key for MCW communication.

Preparation for operation of the shipboard installation is usually very simple. The power is simply switched onto the equipment by means of the main switch, and the silencer level and output level controls adjusted to suit prevailing conditions. Make certain the MCW-Phone switch is on Phone and the IC-Radio switch is on Radio.

Operating condition of the equipment can be readily checked by means of the meter on the panel of the transmitter-receiver unit.

First Check voltage on tube heaters and filaments by moving meter selecting switch to positions 6 and 7. The meter should read 7.5 at both settings which indicates a proper filament balance. Should the

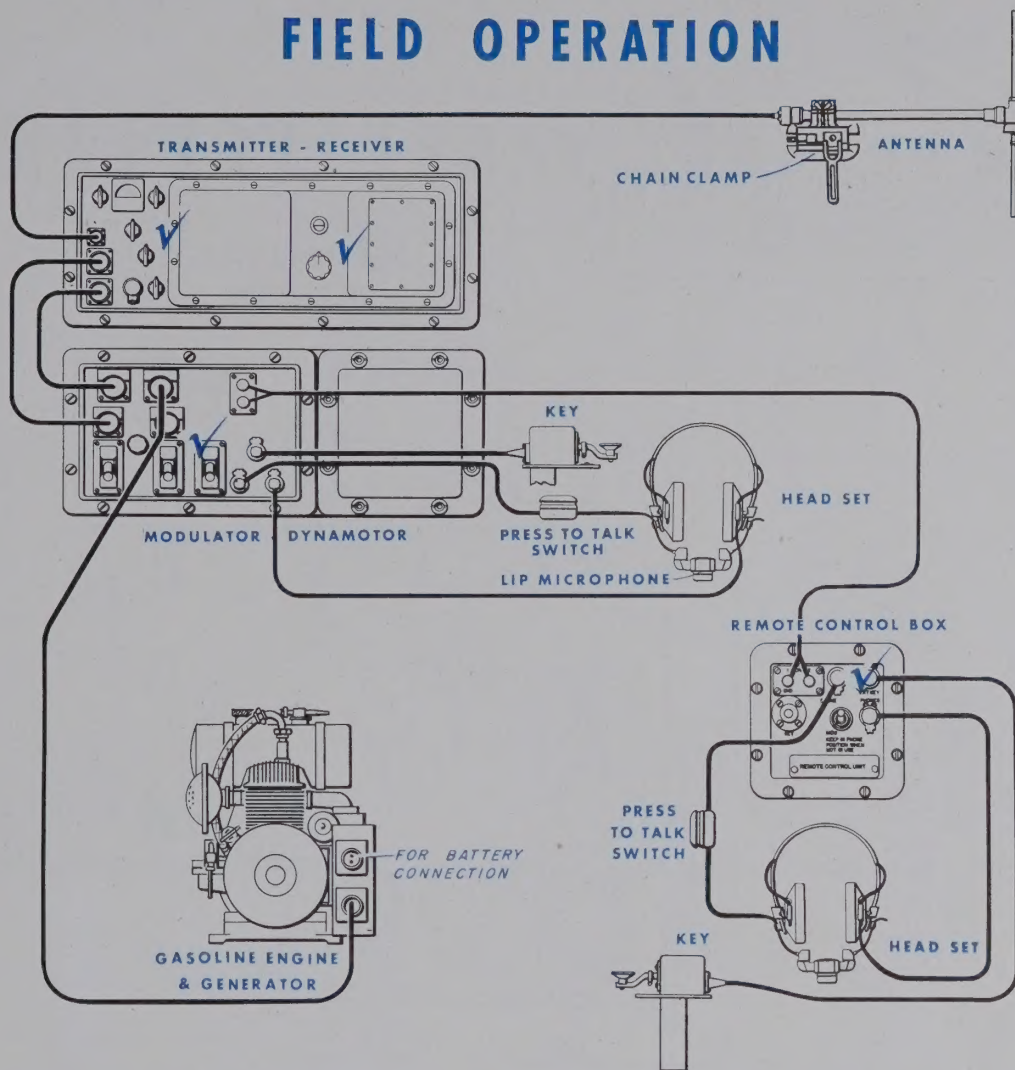
meter readings be alike but less than 7.5, rotate filament control to the right to increase voltage. The absence of filament voltage would indicate trouble in the power supply unit or defective fuses.

Second Check the output of power amplifier. Place meter selecting switch on position 12 and depress press-to-talk switch. A meter reading of 4.5 should be obtained. This indicates proper functioning of the transmitter.

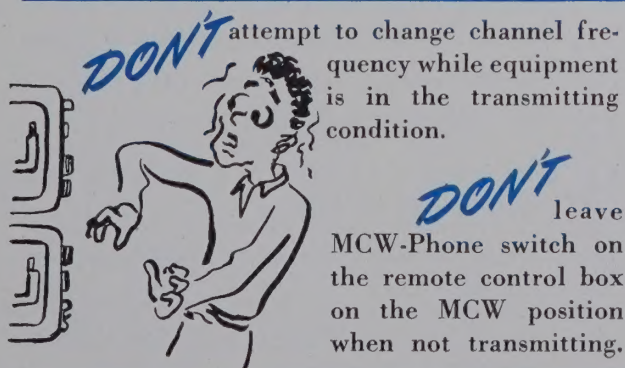
DON'T change channel frequency except between messages. The relay sequence in the equipment renders the receiver silent for several seconds and may interrupt a message.



FIELD OPERATION



Operation of the equipment in the field differs only in that the primary source of power, the gas engine driven generator must be started if the operating period is to be more than a few minutes. The battery will operate the equipment for $1\frac{1}{2}$ hours on transmit and 4 hours on receive but it is advisable to operate the engine whenever possible so the battery will at all times be fully charged.

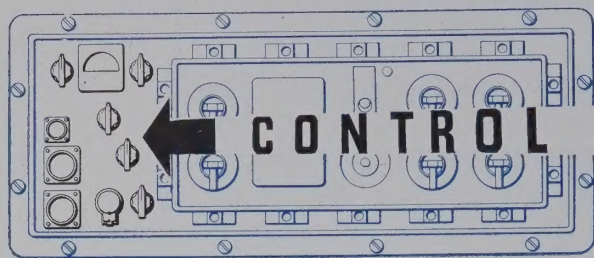


In field application the equipment is switched on by moving the power switch to the Dyn. position, as the dynamotor is employed on the 13V d-c from the generator to obtain plate voltage for the tubes.

The same procedure as with shipboard installations is followed in the preliminary checks which show that the equipment is receiving correct plate and filament voltages and is in operating condition.

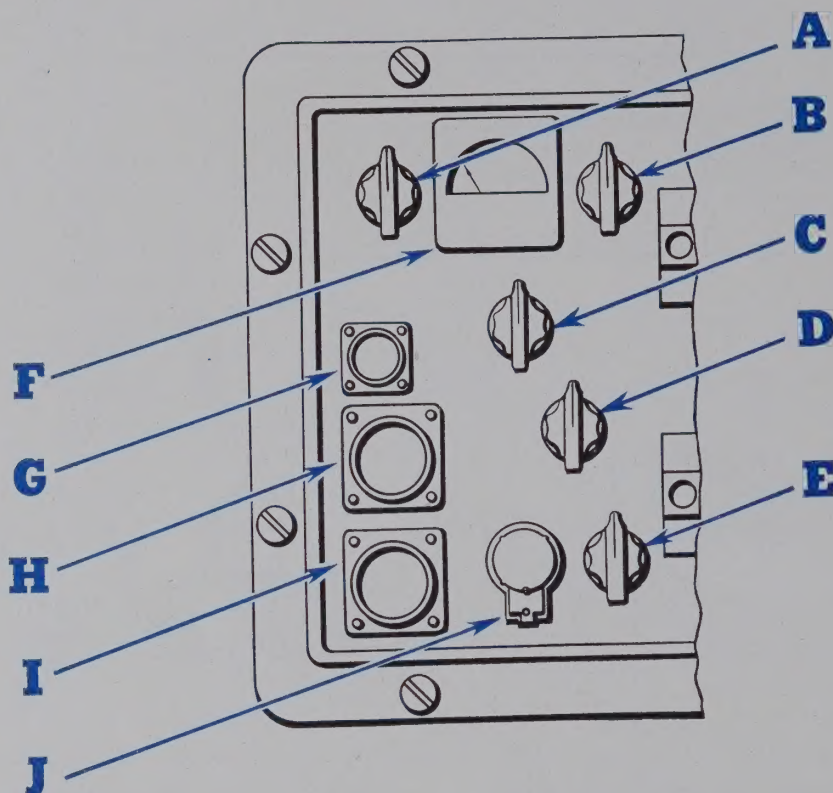
The operating controls are identical in both types of installations, excepting only the position of the switch that starts the equipment. The following pages chart the controls involved in operation and it is well for the operator to familiarize himself with the location and purpose of each control knob so in case of emergency operation can proceed uninterrupted in the dark.

Charts are also provided covering the various phases of operation to provide all the essential information in a compact form.



CONTROL PANEL FITTINGS

TRANSMITTER-RECEIVER



A Silence Level control to adjust level at which noise suppressor functions.

B Antenna trimming capacitor.

C Rotary, 12 point switch to selectively connect meter into circuits to be checked as to voltage and current values.

D Volume control knob for receiver output.

E Silencer switch for cutting off silencer circuit.

F Meter connected to meter switch that permits checking voltage and currents in various circuits as found necessary for tuning or operating the equipment.

G Plug receptacle for antenna lead.

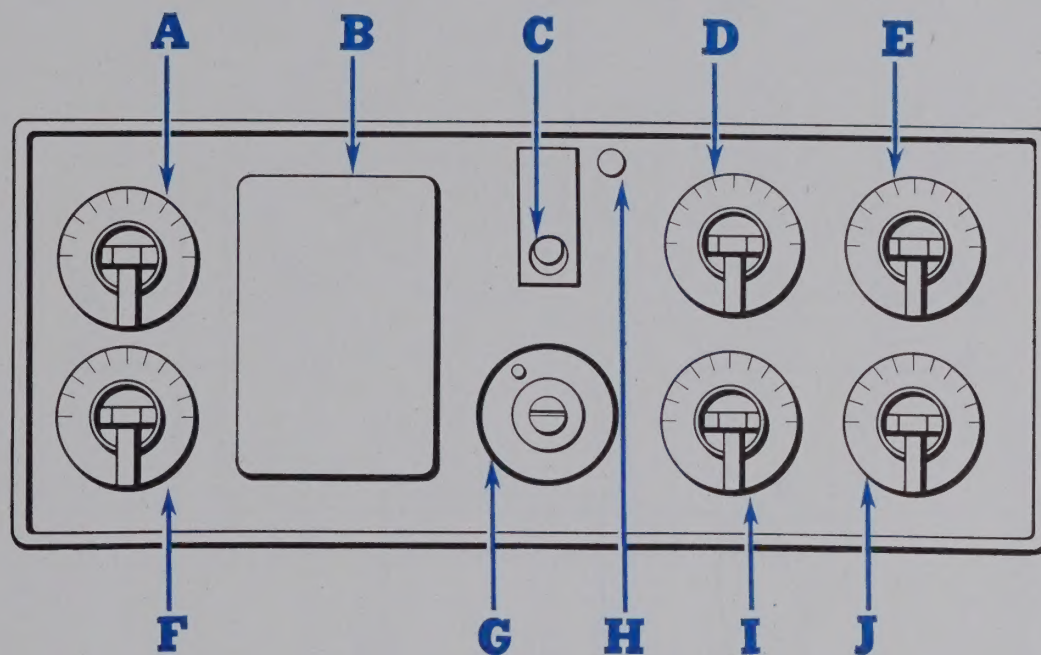
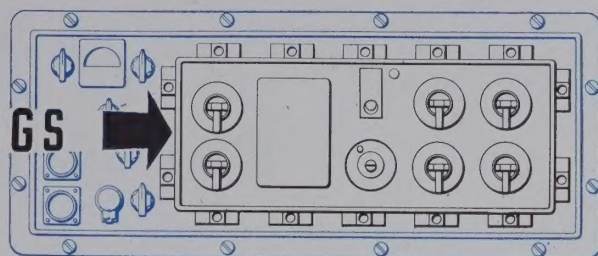
H Plug receptacle to receive 3 conductor cable connecting to Modulator.

I Plug receptacle for power supply cable from Modulator unit.

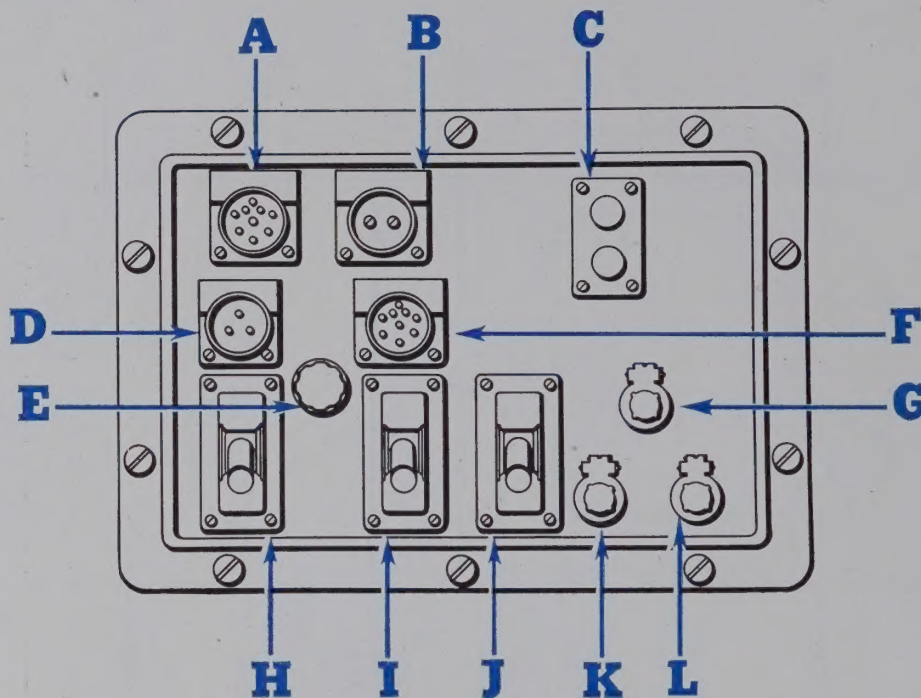
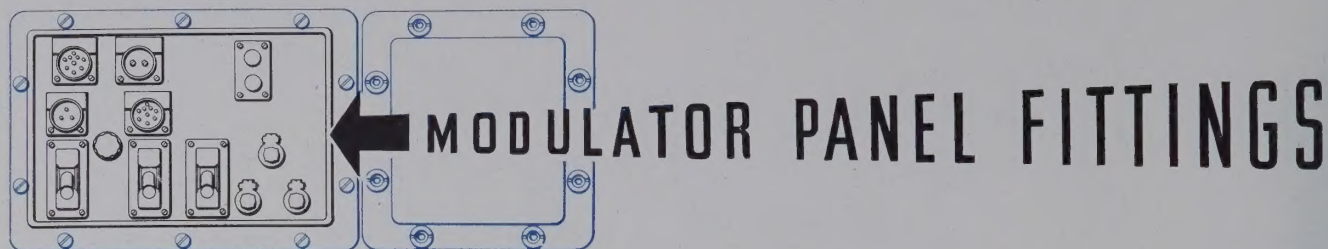
J Jack to receive headset plug for checking operation of equipment.

SELECTOR PANEL FITTINGS

TRANSMITTER-
RECEIVER



- A** Multiplier. This selector is coupled to the shaft driving the ganged variable capacitors that tune the circuits of the frequency multiplier. The fundamental frequency of the crystal is doubled in the first and tripled successively through two tripler stages, all adjusted simultaneously by the multiplier.
- B** Crystal Oven. The ten crystals that control the different channel frequencies are mounted in this compact unit containing thermostatically controlled heating coils to maintain relatively constant temperatures in the unit and eliminate frequency drift.
- C** Pilot light. Intended to indicate the presence of power on the equipment by glowing when the power supply switch is on.
- D** 1st IPA. The control unit for the first intermediate power amplifier stage of the transmitter that drives the power amplifiers.
- E** 2nd IPA. Adjusts the tuning of the input circuit to the second driver stage of power amplification.
- F** R. F.—The tuned antenna, grid input and plate output circuits of the radio frequency stage of the receiver as well as the R. F. and heterodyning frequency input to the first detector are all adjusted by this selector.
- G** Channel Selector. An eleven point rotary switch whose contacts control, through the medium of a relay, the operation of the automatic tuning mechanism. By means of this switch any channel frequency between 225 and 390 MC, available to the equipment, may be selected by rotating the switch.
- H** Frequency test switch for checking frequency output of converter tube in multiplier section.
- I** Antenna Coupling. This selector controls the coupling between the output circuit of the power amplifier and the antenna transmission line, for maximum transfer of energy during transmission.
- J** P. A. Tuning of the grid input circuit of the power amplifier is controlled by this selector.



A Plug receptacle for nine wire cable carrying power supply to Transmitter-Receiver.

B Plug receptacle for cable from battery or other 13 V-DC supply.

C Terminals for connecting wires leading to the remote control unit.

D Plug receptacle for three wire power supply cable to Transmitter-Receiver Unit, mounted on top of the Modulator.

E Rheostat for adjusting filament voltage, voltage being read on meter on panel of Transmitter-Receiver.

F Plug receptacle for power cable from Universal Power Unit, when utilized in the installation.

G Jack for attaching waterproof key for signaling when MCW communication is desired.

H IC-Radio switch, when thrown to the IC position, permits communication between operators at radio equipment and remote control box. Radio position, radio transmission is possible from either station. Middle position used to tune radio equipment.

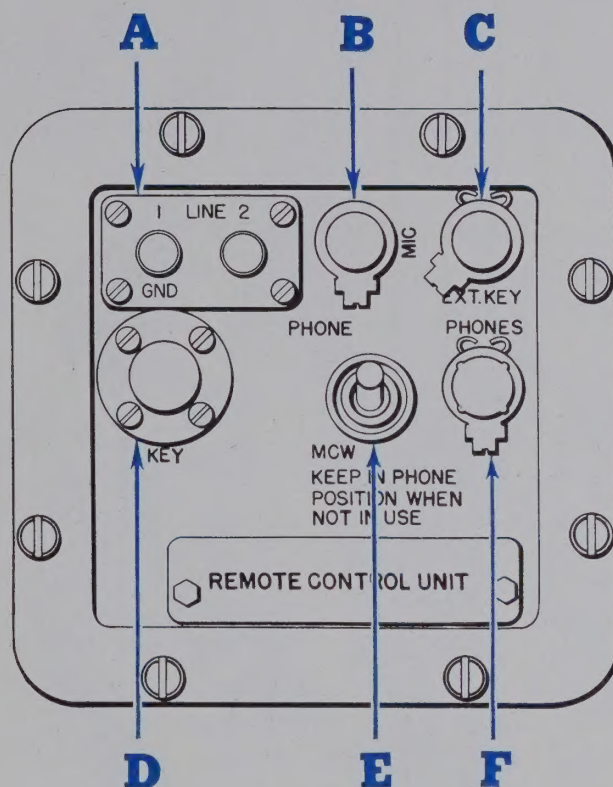
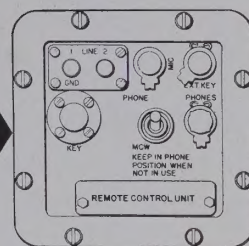
I Power switch for control of power supply to equipment. When batteries or other 13 V-DC supply is used the switch is moved to the DYN position to switch on the equipment. When the Universal Power Supply Unit is in use the equipment is switched to the P. U. position. Power off in center position.

J Switch to changeover from Radio to MCW transmission when thrown to the positions so marked.

K Jack for plugging in extension cord carrying press-to-talk switch, that in turn connects to the lip microphone.

L Jack for headset.

REMOTE CONTROL PANEL FITTINGS



- A** Terminals for connection of leads to radio installation.
- B** Jack for plugging in extension cord carrying the press-to-talk switch, that connects to lip microphone.
- C** Jack for plugging in loose key if desirable.

- D** Built in waterproof key for MCW operation.
- E** Switch to select type of emission, providing phone transmission when thrown up and MCW when moved to the lower position.
- F** Jack for headset.

The remote control box is used only in field applications of the equipment. The remote box being connected to the radio equipment by a two conductor cable or twisted pair of telephone wires. The unit is carried in a canvas bag which has space for the operating accessories.

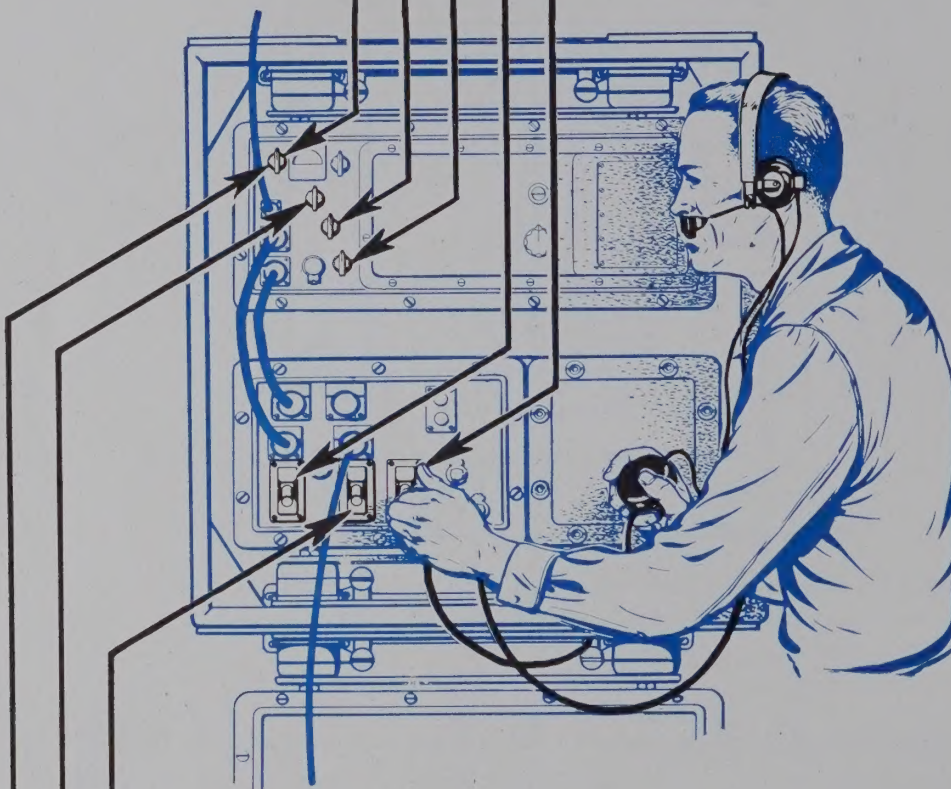
OPERATING THE EQUIPMENT

PRELIMINARY ADJUSTMENTS

Phone-MCW switch on Phone
 IC-Radio switch on Radio
 Silence switch on OFF
 Silence Level at 0
 Output Level at 0

PLUG INTO PROPER JACKS

the headset, microphone with press-to-talk switch, and key, on modulator-dynamotor panel. Place headset on head and adjust microphone over lip by slipping cords through clip.



Move Dyn-PU switch to proper position to switch power on and allow tubes to heat for 3 minutes. Pilot light indicates power on.

Check filament voltage with meter switch using positions 5 and 6, or 6 and 7 when d-c or power supply unit is used for power. Adjust filament control to bring the meter reading to 7.5

Rotate Output Level to right to increase output till rushing or hissing sound is quite loud.

IF no signals, rotate Frequency switch to next point. Trying each channel till signals are heard. Adjust Ant. Comp. for best signal response and reduce Output Level as necessary.

Move Silence switch to ON and rotate Silence Level knob to cut off noise during non-signaling periods

—THEN PROCEED TO OPERATE.

TO TRANSMIT, by phone, depress switch on microphone cord and speak into microphone.

Release button for receiving.

FOR MCW COMMUNICATION. Move Phone-MCW switch to MCW position and proceed to signal by means of key. Return switch to phone position for receiving.

TO TALK TO REMOTE BOX OPERATOR move IC-Radio switch to the IC position, which prevents speech being radiated by transmitter.

TO SHUT DOWN EQUIPMENT move power switch to the center or OFF position. Return Silence Level to 0 setting or turn Silence Switch to OFF to assure reception of weak signals when operation is resumed.

WARNING: Channel Selecting mechanism will not operate with equipment in transmitting condition.

OPERATION AT REMOTE BOX

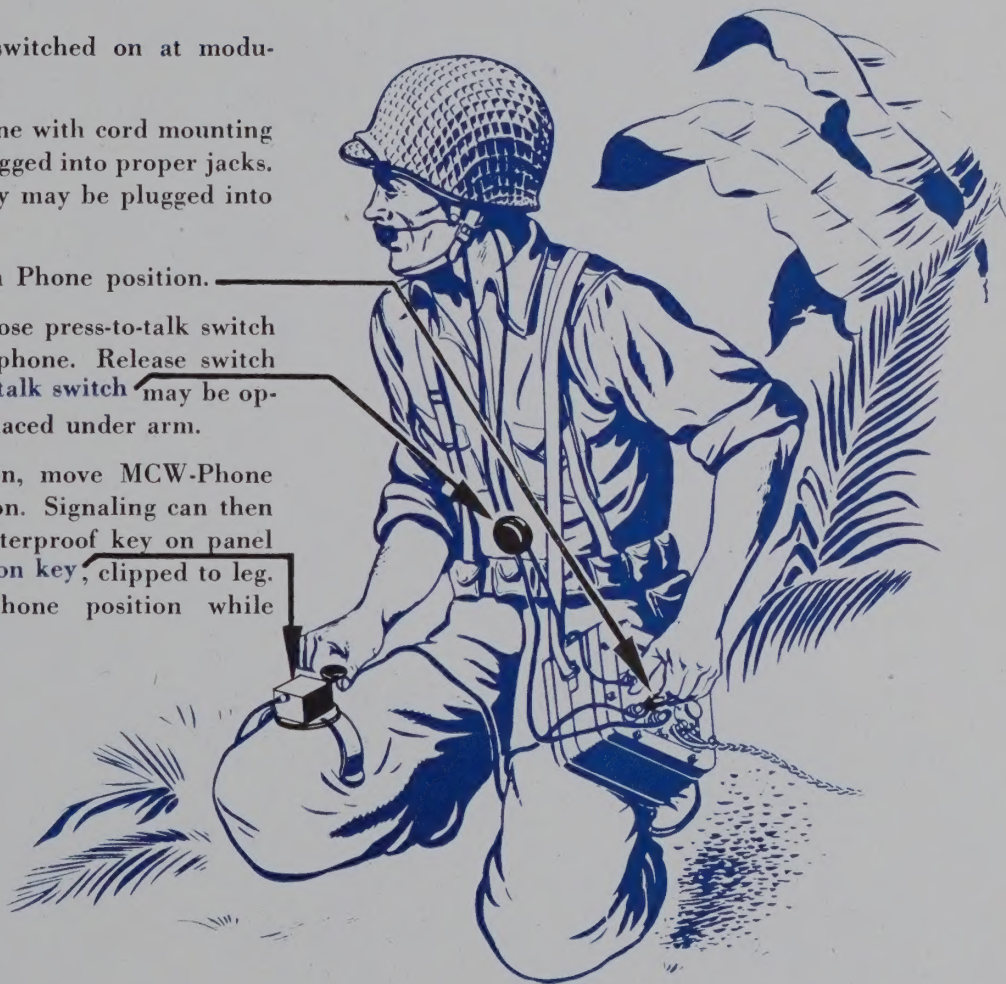
Equipment must be switched on at modulator-dynamotor panel.

Headset and microphone with cord mounting press-to-talk switch plugged into proper jacks. Extension cord and key may be plugged into key jack.

MCW-Phone switch in Phone position.

To transmit speech, close press-to-talk switch and speak into microphone. Release switch for receiving. Press-to-talk switch may be operated by fingers or placed under arm.

For MCW transmission, move MCW-Phone switch to MCW position. Signaling can then be carried on with waterproof key on panel or by means of extension key, clipped to leg. Return switch to Phone position while receiving.



WARNING—

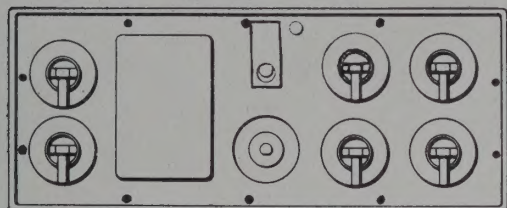
Keep MCW-Phone switch in Phone position when equipment is not in use. Weak voice or MCW signals indicate failing dry cells. Replace as soon as possible.

LUBRICATION CHART

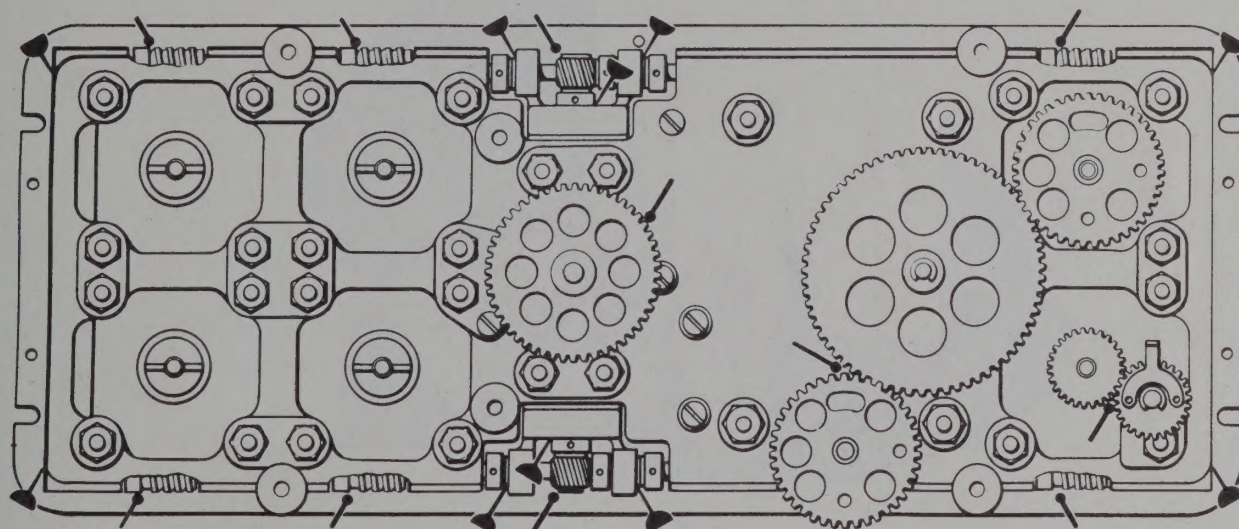
MAR SELECTOR MECHANISM

Lubricate every three months.

To lubricate parts accessible from the front:



Remove cover of selector panel.
Withdraw crystal oven from jack plate.
Remove pin from channel switch coupling and remove coupling. Care must be taken in driving out pin so as not to bend shaft.
Remove switch mounting nuts and lock-washers.
Remove screws holding panel and lift panel over selector dials.



Rear view of selector mechanism showing parts to be lubricated:

LUBRICANT	GREASE	OIL
NAVY TYPE NO.	PD-535-A	N.S.2190-T
NAVY STOCK NO.	14-G-715	14-O-2879
COMMERCIAL DESIGNATION	{ SOCONY VACUUM	SAE-20
LEGEND	OS-1350	
USE	 WORMS AND GEARS	 NEEDLE AND BALL BEARINGS

Apply grease (PD535A) to such gears and worms found accessible from the front as shown. Balance of gears may be reached from top and bottom of chassis through holes in frame. Using an oil can apply oil to bearing surfaces and bearings indicated.

It is advisable to place the chassis so the axis of the bearing being lubricated is in a vertical position so oil will run into bearing. Avoid flowing oil over non-friction surfaces.

Note - Do not lubricate interior of selector switch drums.

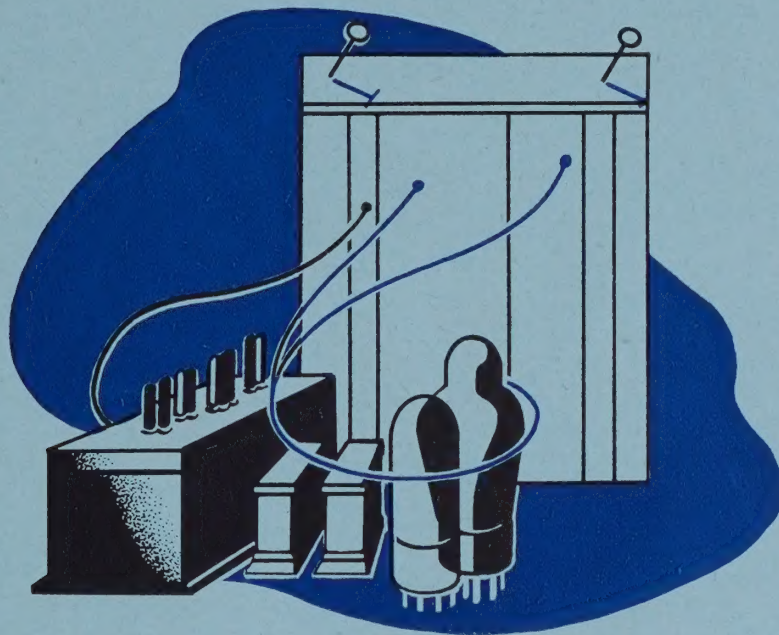
NAVSHIPS 900,719



RESTRICTED

PARTS AND SPARE PARTS

SECTION 8



M-A-R

RADIO TRANSMITTING AND
RECEIVING EQUIPMENT

RESTRICTED

TABLE 8-1
LIST OF MAJOR UNITS
MAR RADIO TRANSMITTING AND RECEIVING EQUIPMENT

QUANTITY	NAME OF MAJOR UNIT	NAVY TYPE DESIGNATION	SYMBOL GROUP
1	TRANSMITTER-RECEIVER	CRV-43067	101 - 699
1	MODULATOR-DYNAMOTOR	CRV-50248	701 - 899
1	UNIVERSAL POWER UNIT	CLG-20379	901 - 999
1	ANTENNA	CRV-66147	1001 - 1099
1	BATTERY CHEST (2 BATTERIES)	CRF-10402-A	1101 - 1199
1	REMOTE CONTROL UNIT	CRV-23485	1201 - 1299
1	GASOLINE ENGINE AND GENERATOR		1301 - 1399
1	ACCESSORY KIT	CRV-10485	1401 - 1499
1	SHIPBOARD MOUNTING CRADLE	CRV-10506	1501 - 1599

CONTRACT NXsr-60008

1B-38370-U1

TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT														
PARTS										SPARE PARTS				
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWC. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP. TENDER QUAN. BOX NO.	QUAN. BOX NO.	STOCK
RECEIVER TRANSMITTER														
1	A-101	Support assembly: selector drive mechanism consisting of support, three shafts, two gear assemblies, three gears, four ball bearings, six needle bearings and two retainer rings mounted on bracket 4.4217" long x 1.406" wide x 1-25/32" thick	Support, Vertical Selector Drive				1	719691-501	A-101	1				1 1
2	A-102	Plate support: glass bonded mica 2-23/32" long x 57/64" wide x 1/8" thick, two 0.199" dia. holes, two 0.120" dia. holes, one 0.125" dia. hole, and two 0.0469" dia. holes	Plate Mycalex Tripler Support	JAN I-10			1	887503-1	A-102	1	1	1	2	1 1 2
3	A-103	Housing assembly: consisting of aluminum housing 12.312" long x 4.687" wide between mounting centers, 3.287" high overall, crystal switch assembly, homing selector switch assembly, limiter switch assembly, six selector switches, gears, gear assemblies, cover assembly, and hardware	Housing, Receiver Transmitter				1	888181-501	A-103	1			2	1 3 2
4	A-104	Support: glass bonded mica, 2-3/4" long x 2-11/32" wide x 1/8" thick, one hole 1.000" dia., two holes 0.250" dia., three holes 0.120" dia., countersunk, three holes 0.109" dia., two holes 0.0469" dia.	Support, Mycalex, for P-A Assembly	JAN I-10			1	888914-1	A-104	1	1	1	1	1 1 2
5	B-602	Motor assembly: consisting of motor 115 v d.c., 1/40 h.p., 5800 r.p.m., starting current 0.6 amp. max., running current 4 amps. max., series wound reversible 3.125" long x 2-3/8" dia. shaft end, x 1-7/8" dia. other end, three mounting holes #6-32 x 5/16" equally spaced on 1-15/16" dia. centers, shaft 0.2500" dia. extends 0.266", three wire leads, black, white and yellow, 10" long, gear assembly consisting of stainless steel pinion 0.3749" O.D. x 0.375" long, 48 pitch, 16 teeth, 0.333 pitch dia., 14-1/2" pressure angle, 3/16" face, stainless steel hub 0.562" long x 0.437" O.D. x 0.2501" I.D. for 0.306" x 0.2801" I.D. to end, #6-32 tap, two holes 0.063" dia. one side	Motor Selector	-211452-A			1358	429658-501	B-602	1	1	1	3	2 2 3

CONTRACT NXsr-60008

18-38570-WNY11

TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS			RECEIVER TRANSMITTER (Continued)										SPARE PARTS				
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS. JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP.	TENDER	BOX NO.	STOCK		
6	B-603	Motor assembly: 12 v a.c. or d.c., 6700 r.p.m. at 12 v a.c., 7850 r.p.m. at 12 v d.c., starting torque 1-1/2 oz./in. to 3 oz./in., starting current max. 2.0 amps. at 12 v a.c. or d.c., running current 1.0 amp. at 12 v a.c. or d.c., including mounting plate with three holes 0.173" dia., hole 15/16" x 15/16" mounting center, and other one 15/16" x 13/32" mounting center, also equipped with ball bearings, shaft 0.2496" dia., 2-7/16" long less fan x 2-5/8" wide x 2-27/32" high overall dimensions	Motor Blower				1172 Motor C-24 1172 Type C-24 1381 Fan 1-1/2	433559-1	B-603	1	2	1	3	2	3		
7	C-101	Capacitor: air, variable, dual, two sections each rated 85 mmf max., must withstand 350 v r-m-s at 60 cycles between opposing plates without break-down	Capacitor, V-101 Grid Tuning	-482810			509	433566-1	C-101	1	2	1	3	1	5		
8	C-102	Capacitor: air variable, 12 mmf max., capacitance, 2.3 mmf min. capacitance, seven stator and seven rotor plates, 3/4" dia. x 5/8" wide x 1-1/2" long, must withstand 500 v r-m-s at 60 cycles between opposing plates without break-down	Capacitor, V-101 Grid Trimmer				887	433585-2	C-102, 104	2	1	1	3	2	5		
9	C-103	Capacitor: air, variable, dual, two sections each rated 69 mmf max., must withstand 550 v r-m-s at 60 cycles between opposing plates without break-down	Capacitor, V-101 Plate Tuning	-482809			509	433909-1	C-103	2	1	3	1	5	1		
	C-104	Same as C-102	Capacitor, V-101 Grid Trimmer						C-104	1							
	C-105	Part of Z-100B	V-102 Cathode Tuning Capacitor						C-105	1							
	C-106	Part of Z-100B	V-102 Grid Plate Tuning Capacitor						C-106	1							
	C-107	Part of Z-100C	V-103 Cathode Tuning Capacitor						C-107	1							
	C-108	Part of Z-100C	V-103 Grid Plate Tuning Capacitor						C-108	1							

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS							
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS. JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	TENDER	BOX NO.	QUAN.	STOCK
RECEIVER TRANSMITTER (Continued)																	
10	C-109	Capacitor: fixed, silver mica, 2400 mmf $\pm 10\%$, 350 v a.c., 500 v d.c. working, 31/64" x 3/4" long	Capacitor, V-101 Cathode By-pass	-482814 R8 484 402			727 Cat. #832 Modified	887816-1	C-109, 110, 111, 121, 122, 123, 124, 125, 248, 312, 313, 317, 321, 324, 331, 332, 333, 334, 335, 515, 518, 521, 523, 526, 527, 531, 534, 535, 536, 812	30	2	7	3	21	5	34	
	C-110	Same as C-109	Capacitor, V-101 Screen By-pass	-482814					C-110	1							
	C-111	Same as C-109	Capacitor, V-101 Plate By-pass	-482814					C-111	1							
	C-112	Part of Z-100B	Capacitor, V-102 Grid Plate Trimmer						C-112	1							
	C-113	Part of Z-100B	Capacitor, V-102 Plate Blocking						C-113	1							
	C-114	Not Used															
	C-115	Part of Z-100C	Capacitor, V-103 Plate Blocking						C-115	1							
	C-116	Part of Z-100B	Capacitor, V-102 Bias By-pass						C-116	1							
11	C-117	Capacitor: variable, steatite ceramic, min. capacitance 0.45 mf max., max. capacitance 6.7 mf min., 0.375" square mounting plate approx. 5/8" long with 0.020" screwdriver slot	Capacitor, V-102 Grid Cathode Trimmer				207	889520-1	C-117, 118	2	1	2	2	3	1	3	
	C-118	Same as C-117	Capacitor, V-103 Grid Cathode Trimmer						C-118	1							
	C-119	Part of Z-100C	Capacitor, V-103 Output Cable Grounding						C-119	1							
	C-120	Part of Z-100C	Capacitor, V-103 Grid Plate Trimmer						C-120	1							
	C-121	Same as C-109, except 2400 mmf $\pm 20\%$	Capacitor, V-103 Heater By-pass	-482814					C-121	1							
	C-122	Same as C-109, except 2400 mmf $\pm 20\%$	Capacitor, V-103 Heater By-pass	-482814					C-122	1							

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS				
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWG, JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP.	TENDER	STOCK	QUAN.
RECEIVER TRANSMITTER (Continued)														
C-123	Same as C-109	Capacitor, V-103 Plate By-pass	-482814					C-123	1					
C-124	Same as C-109	Capacitor, V-103 Plate By-pass	-482814					C-124	1					
C-125	Same as C-109	Capacitor, V-103 Grid By-pass	-482814					C-125	1					
C-126	Same as C-109	Capacitor, V-101 Filament By-pass	-482814					C-126	1					
C-127	Same as C-109	Capacitor, V-101 Filament By-pass	-482814					C-127	1					
C-201	Capacitor: variable, air, rated 2.2 to 9 mmf, one stator, two rotor plates, 1-7/32" dia. x 1-5/32" long x 15/16" wide, must withstand 500 v r-m-s at 60 cycles between opposing plates with- out breakdown	Capacitor, Antenna Compensator	-482812			1	433576-1	C-201	1	2	1	3	1	5
C-202	Capacitor: variable, air, 10.3 mmf max. capacitance, 2.3 min. capacitance, six stator, six rotor plates, 3/4" dia. x 1-13/32" long x 5/8" wide	Capacitor, Receiver Antenna Circuit Trimmer				887	433585-1	C-202, 206, 210, 214, 218	5	2	3	3	5	5
C-203	Not Used													
C-204	Capacitor: fixed, silver mica, 500 mmf 110%, 350 v a.c., 500 v d.c. working, two brass silver-plated terminals, lug type, 29/64" dia. 7/16" long	Capacitor, V-201 Grid Filter	-482813-10 48 A 439			727 Cat. #830	888508-1	C-204, 227, 228, 229, 512, 530	6	2	2	3	5	7
C-205	Capacitor: variable, air, dual, 4.5 to 50 mmf, one section 1-1/8" deep x 15/16" wide x 1-7/32" high, seven stator, seven rotor plates, rotor grounded to mounting lug, must with- stand 500 v r-m-s at 60 cycles between opposing plates, ceramic base, two #4-40 tapped holes on 21/32" mounting centers	Capacitor, Antenna Padder	-482811			1	433905-1	C-205, 209, 213 217, 221	5	2	3	3	5	5
C-206	Same as C-202	Capacitor, V-201 Grid Trimmer						C-206	1					
C-207, 208	Not Used													
C-209	Same as C-205	Capacitor, V-201 Grid Padder	-482811					C-209	1					
C-210	Same as C-202	Capacitor, V-201 Plate Trimmer						C-210	1					
C-211, 212	Not Used													

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS																	SPARE PARTS					
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AMS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	JUAN.	BOX NO.	JUAN.	BOX NO.	JUAN.						
RECEIVER TRANSMITTER (Continued)																						
16	C-213	Same as C-205	Capacitor, V-201 Plate Padder	-482811					C-213	1												
	C-214	Same as C-204	Capacitor, V-202 Grid Trimmer						C-214	1												
	C-215, 216	Not Used																				
	C-217	Same as C-205	Capacitor, V-201 Grid Padder	-482811					C-217	1												
	C-218	Same as C-202	Capacitor, V-203 Plate Trimmer						C-218	1												
	C-219, 220	Not Used																				
	C-221	Same as C-205	Capacitor, V-203 Plate Padder	-482811					C-221	1												
	C-222	Capacitor: titanium oxide, fixed, 1800 mmf $\pm 20\%$, 350 v d.c. working, 1-1/8" long x 5/16 hex., two hook terminals	Capacitor, V-201 A.V.C. Filter	-482869-20 RE 48A 447			1 High K	887883-3	C-222, 225, 226, 244, 245, 246, 247, 349, 350, 351, 352, 353, 354, 510, 511, 525, 526, 529, 538	19	2	4	3	12	5	19						
	C-223	Same as C-204	Capacitor, V-203 Plate By-pass	-482813-10					C-223	1												
	C-224	Capacitor: titanium oxide, ceramic, insulated 700 mmf $\pm 20\%$, 350 v d.c. working, 19/32" max. length, single radial lead 2-1/4" long, #2-56 tap for screw 1/4" deep	Capacitor, V-201 Screen By-pass	-482816			1 High K	893972-2	C-224, 231, 232, 233, 234, 235, 236, 239, 240, 241	10	2	2	3	6	5	10						
17	C-225	Same as C-222	Capacitor, V-201 Plate Simply	-482869-20					C-225	1												
	C-226	Same as C-222	Capacitor, V-201 Plate Simply	-482869-20					C-226	1												
	C-227	Same as C-223	Capacitor, V-202 Grid Filter	-482813-10					C-227	1												
	C-228	Same as C-223	Capacitor, V-202 Screen By-pass	-482813-10					C-228	1												
	C-229	Same as C-223	Capacitor, V-203 Plate By-pass	-482813-10					C-229	1												
	C-230	Not Used																				
	C-231	Same as C-224	Capacitor, V-201 Cathode By-pass	-482816					C-241	1												
	C-232	Same as C-224	Capacitor, V-201 Heater By-pass	-482816					C-232	1												
	C-233	Same as C-224	Capacitor, V-201 Cathode By-pass	-482816					C-233	1												

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																	
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS						
											EQUIP.	TENDER	STOCK	BOX NO.	QUAN.	QUAN.	QUAN.
RECEIVER TRANSMITTER (Continued)																	
	C-234	Same as C-224	Capacitor, V-202 Cathode By-pass	-482816					C-234	1							
	C-235	Same as C-224	Capacitor, V-202 Heater By-pass	-482816					C-235	1							
	C-236	Same as C-224	Capacitor, V-202 Cathode By-pass	-482816					C-236	1							
	C-237, 238	Not Used															
	C-239	Same as C-224	Capacitor, V-203 Cathode By-pass	-482816					C-239	1							
	C-240	Same as C-224	Capacitor, V-203 Heater By-pass	-482816					C-240								
	C-241	Same as C-224	Capacitor, V-203 Heater By-pass	-482816					C-241	1							
	C-242, 243	Not Used															
	C-244	Same as C-222	Capacitor, R-F Filament By-pass	-482869-20					C-244	1							
	C-245	Same as C-222	Capacitor, R-F Filament By-pass	-482869-20					C-245	1							
	C-246	Same as C-222	Capacitor, R-F Filament By-pass	-482869-20					C-246	1							
	C-247	Same as C-222	Capacitor, V-203 Grid Return	-482869-20					C-247	1							
	C-248	Same as C-109	Capacitor, V-203 Grid Filter	-482814					C-248	1							
18	C-301	Capacitor: fixed, non-insulated, com- position, 47 mmf $\pm 1/2\%$, 500 v d.c. working, 0.460" long x 0.240" dia., two radial wire leads	Capacitor, Z-301 Primary Tuning	JAN C-20			1	429660-1	C-301, 302, 303, 304, 305, 306, 307, 308, 309, 310	10	2	2	1	6	2	10	
	C-302	Same as C-301	Capacitor, Z-301 Secondary Tuning						C-302	1							
	C-303	Same as C-301	Capacitor, Z-302 Primary Tuning						C-303	1							
	C-304	Same as C-301	Capacitor, Z-302 Secondary Tuning						C-304	1							
	C-305	Same as C-301	Capacitor, Z-303 Primary Tuning						C-305	1							
	C-306	Same as C-301	Capacitor, Z-303 Secondary Tuning						C-306	1							

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																							
PARTS										RECEIVER TRANSMITTER (Continued)													
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS												
											EQUIP.	TENDER	STOCK	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.
	C-307	Same as C-301	Capacitor, Z-304 Primary Tuning						C-307	1													
	C-308	Same as C-301	Capacitor, Z-304 Secondary Tuning						C-308	1													
	C-309	Same as C-301	Capacitor, Z-305 Primary Tuning						C-309	1													
	C-310	Same as C-301	Capacitor, Z-305 Secondary Tuning						C-310	1													
19	C-311	Capacitor: fixed, ceramic, 1500 mmf ±20%, insulated, operating voltage 350 v d.c., 9/32" dia., 13/16" long, two axial leads 1-3/4" long	Capacitor, V-301 Grid By-pass	-482815			1	888556-1	C-311, 314, 315, 316, 318, 319, 320, 322, 323, 325, 326, 330, 336, 338, 339	15													
	C-312	Same as C-109	Capacitor, Z-301 Plate By-pass	-482814					C-312	1													
	C-313	Same as C-109	Capacitor, V-301 Cathode By-pass	-482814					C-313	1													
	C-314	Same as C-311	Capacitor, V-301 Screen By-pass	-482814					C-314	1													
	C-315	Same as C-311	Capacitor, V-301 Plate By-pass	-482815					C-315	1													
	C-316	Same as C-311	Capacitor, V-302 Grid By-pass	-482815					C-316	1													
	C-317	Same as C-109	Capacitor, V-302 Cathode By-pass	-482814					C-317	1													
	C-318	Same as C-311	Capacitor, V-302 Screen By-pass	-482815					C-318	1													
	C-319	Same as C-311	Capacitor, V-303 Grid By-pass	-482815					C-319	1													
	C-320	Same as C-311	Capacitor, V-302 Plate By-pass	-482815					C-320	1													
	C-321	Same as C-109	Capacitor, V-303 Cathode By-pass	-482814					C-321	1													
	C-322	Same as C-311	Capacitor, V-303 Screen By-pass	-482815					C-322	1													
	C-323	Same as C-311	Capacitor, V-303 Plate By-pass	-482815					C-323	1													
	C-324	Same as C-109	Capacitor, V-304 Cathode By-pass	-482814					C-324	1													

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 6-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																	
PARTS										RECEIVER TRANSMITTER (Continued)							
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS						
											BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.	STOCK NO.
	C-325	Same as C-311	Capacitor, V-304 Screen By- Pass	-482815					C-325	1							
	C-326	Same as C-311	Capacitor, V-304 Plate By- Pass	-482815					C-326	1							
20	C-327	Capacitor: fixed, ceramic, 47 mmf $\pm 10\%$, 500 v d.c. working, 0.562" long x 0.250" dia., two axial wire leads 1-1/4" long	Capacitor, V-305 A.V.C. Coupling	JAN CC21U- J470K JAN C-20			722	722408-426	C-327	1	1	1	1	1	1	1	4
21	C-328	Capacitor: titanium oxide, 500 mmf $\pm 20\%$, insulated through capacitor, brass bushing 5/16" hex., #12-28 threads 1-1/8" long, two axial wire leads with 1/8" hook at each end	Capacitor, V-305 Plate Return	-482867-20 RE 48A 447 -1			1 High K	887883-1	C-328	1	2	1	3	1	5	1	1
22	C-329	Capacitor: fixed, paper, tubular 0.020 mf +30% -20%, 600 v d.c. working, 7/16" dia. x 1-1/2" long metal case, mineral oil impregnated, two axial wire leads 2-1/4" long; for replacement use -482625-20	Capacitor, A.V.C. Time Constant, V-305	RE 48A 163			590 P-X-24A	95618-37	C-329, 337, 706, 726	4	1	2	1	5	4	8	
	C-330	Same as C-311	Capacitor, for I-F Plate Supply By-pass	-482815					C-330	1							
	C-331	Same as C-109	Capacitor, V-301 Filter By- Pass	-482814					C-331	1							
	C-332	Same as C-109	Capacitor, V-302 Filter By- Pass	-482814					C-332	1							
	C-333	Same as C-109	Capacitor, V-303 Filter By- Pass	-482814					C-333	1							
	C-334	Same as C-109	Capacitor, V-304 Filter By- Pass	-482814					C-334	1							
	C-335	Same as C-109	Capacitor, V-305 Filter By- Pass	-482814					C-335	1							
	C-336	Same as C-311	Capacitor, V-305 Cathode By- Pass	-482815					C-336	1							
	C-337	Same as C-329	Capacitor, Cathode Time Constant V-305						C-337	1							

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																		
PARTS										SPARE PARTS								
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS, JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.
RECEIVER TRANSMITTER (Continued)																		
	C-338	Same as C-311	Capacitor, I-F Plate Supply By-pass	-482815					C-338	1								
	C-339	Same as C-311	Capacitor, V-304 Plate By- Pass	-482815					C-339	1								
	C-340 to C-348	Not Used																
	C-349	Same as C-222	Capacitor, Filament Line Feed-Through By-pass	-482869-20					C-349	1								
	C-350	Same as C-222	Capacitor, Plate Supply Feed- Through By-pass	-482869-20					C-350	1								
	C-351	Same as C-222	Capacitor, A.V.C. Line Feed- Through By-pass	-482869-20					C-351	1								
	C-352	Same as C-222	Capacitor, Detector Cathode By-pass	-482869-20					C-352	1								
	C-353	Same as C-222	Capacitor, Plate Supply Feed- Through By-pass	-482869-20					C-353	1								
	C-354	Same as C-222	Capacitor, Screen Supply Feed- Through By-pass	-482869-20					C-354	1								
23	C-402	Capacitor: fixed, paper, 0.010 mf $\pm 60\%$ -20%, 400 v d.c. working, metal case, nyranol, oil filled, 1" long x 7/16" dia., one axial wire lead 1-1/2" long, and one terminal soldered at right angles to side; for replacement use -482808	Capacitor, V-401 Filter	RE 48A 440			207	889572-1	C-402, 406	2	1	1	1	3	4	5		
24	C-403 C-404	Not Used Capacitor: fixed, mica, 10,000 mmf $\pm 10\%$, 500 v d.c. working, 1-1/32" long max., x 41/64" wide max. x 11/32" high max., two axial leads each 1-3/8" long	Capacitor, V-401 Output Coupling	JAN CM40B- 103K JAN C-5			722	722035-563	C-404, 411, 415, 417	4	2	1	3	3	5	4		
25	C-405	Capacitor: fixed, molded mica, 1000 mmf $\pm 10\%$, 500 v d.c. working, 53/64" square x 9/32" thick with two axial leads 1-1/8" long	Capacitor, V-401 Output Shunt	JAN CM30B- 102K JAN C-5			793 Tyne CM30	722017-559	C-405	1	2	1	3	1	5	1		

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS									
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP.	TENDER	BOX NO.	STOCK				
RECEIVER TRANSMITTER (Continued)																			
26	C-406	Same as C-402	Capacitor, V-402 Grid Squelch						C-406	1									
	C-407	Capacitor: fixed, oil filled, 1.0 mf $\pm 10\%$ -38, 400 v d.c. working, sealed in metal can 2-3/4" high x 1-11/32" long x 23/32" wide overall	Capacitor, V-402 Cathode By-Pass	-48595A RE 13A 488			1 72053-508	720555-2	C-407, 409, 410, 414	4	1	2	1	6	10				
27	C-408	Capacitor: paper, oil filled, 0.250 mfd $\pm 10\%$ -38, 400 v d.c. working, 1-7/8" high x 1-11/32" long x 23/32" wide	Capacitor, V-202 Plate Squelch	-481176 RE 13A 488			1 72053-511	720555-1	C-408	1	1	1	1	2	4				
	C-409	Same as C-407	Capacitor, V-402 Plate By-Pass	-48595A					C-409	1									
	C-410	Same as C-407	Capacitor, Bleeder By-pass	-48595A					C-410	1									
	C-411	Same as C-404	Capacitor, V-402 Output Coupling	JAN CM40B-103K					C-411	1									
28	C-412	Not Used																	
	C-413	Capacitor: fixed, molded mica, 1500 mfd $\pm 10\%$, 500 v d.c. working, 53/64" square x 9/32" thick, with two axial leads 1-1/8" long	Capacitor, V-403 Grid Shunt	JAN CM30B-152K JAN C-5			1	722017-569	C-413	1	2	1	3	1	5				
29	C-414	Same as C-407	Capacitor, V-403 Cathode By-Pass	-48595A					C-414	1									
	C-415	Same as C-404	Capacitor, V-401 Output Coupling	JAN CM40B-103K					C-415	1									
	C-416	Capacitor: fixed, molded mica, 1800 mfd $\pm 10\%$, 500 v d.c. working, 53/64" square x 9/32" thick, with two axial leads 1-1/8" long	Capacitor, V-403 Side Tone	JAN CM30B-182K JAN C-5			1	722017-565	C-416	1	2	1	3	1	5				
	C-417	Same as C-404	Capacitor, Squelch Control Shunt	JAN CM40B-103K					C-417	1									

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																
PARTS										SPARE PARTS						
	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWG, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP. JUAN.	TENDER BOX NO.	JUAN.	STOCK BOX NO.	
RECEIVER TRANSMITTER (Continued)																
30	C-505	Capacitor: variable, air dielectric, four sections: sections A, B and C 68.5 mmf max. capacity and 4.5 mmf min. capacity; section D 45.5 max. capacity and min. capacity less than 4.0 mmf 500 r-m-s test; 9-5/8" long x 1-1/4" wide x 1-63/64" high, shaft 2" long x 0.250" dia., three 0.173" mounting holes on 7-5/8" x 15/16" centers	Condenser, Multinlier Tuning				1	719687-1	C-505, 505A, 505B, 505C, 505D	5	2	1	3	1	5	
	C-505A	Same as C-505	Condenser, V-501 Plate Tuning						C-505A	1						
	C-505B	Same as C-505	Condenser, V-502 Plate Tuning						C-505B	1						
	C-505C	Same as C-505	Condenser, V-503 Plate Tuning						C-505C	1						
	C-505D	Same as C-505	Condenser, V-504 Plate Tuning						C-505D	1						
31	C-506	Capacitor: variable, ceramic dielectric, 7 mmf min. to 45 mmf max., temp. coeff. -500 mmf/mm ² /°C. x 10 -6; 55/64" long x 41/64" wide x 3/8" high, two radial lug terminals	Capacitor, V-502 Plate Pad Trimmer	TS-2A			207	868903-3	C-506	1	1	1	2	1	4	
	C-507 508	Not Used														
32	C-509	Capacitor: fixed, silver mica, 2400 mmf ±5%, 500 v d.c. working, 3/4" long including terminal x 31/64" dia.	Capacitor, V-501 Plate Pad	JAN 71-2202			727 Cat. #83a	887816-2	C-509	1	1	1	2	1	2	
	C-510	Same as C-222	Capacitor, Plate Supply Feed-Through By-pass	-482869-20					C-510	1						
	C-511	Same as C-222	Capacitor, Bias Supply Feed-Through By-pass	-482869-20					C-511	1						
	C-512	Same as C-223	Capacitor, V-501 Grid By-pass	-482813-10					C-512	1						
32a	C-513	Capacitor: fixed, ceramic, dielectric, 8 mmf ±5%, 500 v d.c. working, 0.562" max. length x 0.250" max. dia., two axial wire leads 1-1/4" long	Capacitor, V-501 Grid Coupling	JAN CC21BH-080D JAN-C-20			722 CC21	722407-11	C-513	1	2	1	1	1	2	
33	C-514	Capacitor: fixed, silver mica, 280 mmf ±2-1/2%, 500 v d.c. working, 29/64" dia. x 11/32" long, with 9/32" long lug terminal one end and #4-40 tan x 1/8" dia. hole other end	Capacitor, V-502 Plate Pad				727 Cat. #830	888508-3	C-514	1	2	1	1	1	2	

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																						
PARTS												SPARE PARTS										
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.
RECEIVER TRANSMITTER (Continued)																						
	C-515	Same as C-109	Capacitor, V-502 Grid By-pass	-482814					C-515	1												
34	C-516	Capacitor: fixed, ceramic dielectric 91 mmf $\pm 10\%$, 500 v d.c. working, non-insulated, two wire terminals	Capacitor V-502 Grid Coupling	JAN CC30DJ-910K JAN C-20			321	722423-383	C-516	1	2	1	3	1	5							
35	C-517	Capacitor: fixed, silver mica, 720 mmf $\pm 2-1/2\%$, 500 v d.c. working, 15/32" long x 31/64" dia., with 9/32" long lug terminal one end and #4-40 tan hole x 1/8" deep in 7/32" dia. hub other end	Capacitor, V-503 Plate Pad	JAN 71-2202			727 Cat. #834	894398-1	C-517	1	1	1	2	1	3	1						
	C-518	Same as C-109, except 2400 mmf $\pm 20\%$	Capacitor, V-503 Grid By-pass	-482814					C-518	1												
36	C-519	Capacitor: mica, 120 mmf $\pm 5\%$, 500 v d.c. working, 13/64" thick x 5/8" wide x 1" long, two axial wire leads 3/8" long, temp. coeff. to .01 for 1°C.	Capacitor, V-503 Grid Coupling	48A 154			203, 603M 207, M3K120 710, M051M 714, 1469 724, PO 793, SRS	720538-38	C-519, 522	2	2	1	3	2	5							
37	C-520	Capacitor: fixed, silver mica, 850 mmf $\pm 2-1/2\%$, 500 v d.c. working, 15/32" long x 31/64" dia., with 9/32" long lug terminal one end and #4-40 tan hole x 1/8" deep in 7/32" dia. hub other end	Capacitor, V-504 Plate Pad	JAN 71-2202			727 Cat. #834	894398-2	C-520	1	1	1	2	1	3	1						
	C-521	Same as C-109, except 2400 mmf $\pm 20\%$	Capacitor, V-504 Cathode By-Pass	-482814					C-521	1												
	C-522	Same as C-519	Capacitor, V-505 Output Coupling						C-522	1												
	C-523	Same as C-109, except 2400 mmf $\pm 20\%$	Capacitor, V-505 Plate By-Pass	-482814					C-523	1												
38	C-524	Capacitor: fixed, ceramic, non-insulated dielectric, 39 mmf $\pm 2\%$, 500 v d.c. working, 0.240" max. dia. x 0.460" max. length with two radial leads 1-1/4" long	Capacitor, V-505 Plate Tuning	JAN CC30BH-390G JAN C-20			727	722421-24	C-524	1	2	1	1	1	2	1						
	C-525	Same as C-222	Capacitor Plate Shuntly Feed-Through By-pass	-482869-20					C-525	1												

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT															
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS				
											EQUIP.	TENDER	STOCK	QUAN.	QUAN.
RECEIVER TRANSMITTER (Continued)															
	C-526	Same as C-109	Capacitor, V-505 Cathode By-pass	-482814					C-526	1					
	C-527	Same as C-109	Capacitor, V-502 Heater By-pass	-482814					C-527	1					
	C-528	Same as C-222, except 12.6 v	Capacitor, Heater Supply Line By-pass	-482869-20					C-528	1					
	C-529	Same as C-222, except 6.3 v	Capacitor, Heater Supply Line By-pass	-482869-20					C-529	1					
	C-530	Same as C-223	Capacitor, V-504 Heater By- Pass	-482813-10					C-530	1					
	C-531	Same as C-109	Capacitor, V-503 Heater By-pass	-482814					C-531	1					
39	C-532	Capacitor: fixed, oil impregnated 0.1 mf 120%, 300 v d.c. working, molded case 1-7/16" long x 3/8" thick x 3/4" wide, axial leads 1-1/4" long	Capacitor, Thermostat By- Pass				721 C75/221	97670-10	C-532	1	2	1	2	3	3
	C-533	Same as C-532	Capacitor, Thermostat By-pass						C-533	1					
	C-534	Same as C-109	Capacitor, V-502 Plate Filter	-482814					C-534	1					
	C-535	Same as C-109	Capacitor, V-503 Plate Filter	-482814					C-535	1					
	C-536	Same as C-109	Capacitor, V-504 Heater By- Pass	-482814					C-536	1					
40	C-537	Capacitor: fixed, mica, 100 mmf $\pm 5\%$, 500 v d.c. working, 51/64" max. length x 15/32" max. width x 7/32" max. thickness, two axial wire leads 1-1/8" long	Capacitor, V-504 Screen Shunt	OM20C101J JAN C-5			1	722004-523	C-537	1	1	1	2	1	3
	C-538	Same as C-222	Capacitor, V-505 Cathode Return By-pass	-482869-20					C-538	1					

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT														
PARTS										SPARE PARTS				
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RECEIVER TRANSMITTER (Continued)														
41	E-101A	Knob: aluminum, 1-5/16" long x 3/4" wide x 25/32" high overall, shaft hole 5/8" dia. for 11/32", 0.251" dia. for 5/16", two setscrew holes #8-32 taps	Knob, Control for S-101				179	888558-2	E-101A, 203A, 401A, 403A, 404A	5				5
42	E-102	Insulator: mica, 0.003" thick, 2.265" dia., 1.125" I.D., four 0.128" dia. holes equally spaced on 1.625" dia.	Insulator, Disc Flange Tripler Assembly				1	887217-1	E-102, 103	2	1	1	2	1 4
	E-103	Same as E-102	Insulator, Disc Flange P-A Assembly						E-103	1				
43	E-104	Insulator: mica, 1/64" thick, 3/8" O.D., 0.156" I.D.	Insulator, P-A Coupling Loop				1	887581-1	E-104	1	1	1	2	1 4
44	E-105	Insulator: bushing, bakelite, BM-262 natural, 0.375" dia. of shoulder, 0.275" dia. of body, 0.437" long overall, 0.156" I.D.	Insulator, P-A Coupling Loop				1	887587-1	E-105	1	1	1	2	1 4
45	E-106	Terminal strip: black molded bakelite, 7-3/8" long x 7/8" wide x 13/32" thick, 18 terminals, 14 with links and screws engraved 1 to 14, four blanks	Terminal Board, for Receiver Transmitter				334 Cat. #18-140	888968-1	E-106	1				1 1
46	E-107	Insulator: mica, silver-coated both sides, 0.004" thick x 2.265" O.D. x 0.437" I.D. with four 0.128" dia. holes on 1.625" dia.	Tripler Assembly, Disc Flange Insulator				1	889200-1	E-107	1	1	1	2	1 2
	E-108 to E-121	Not Used												
47	E-122	Insulator: bushing, bakelite, BM-262 natural, 7/8" O.D. x 0.5025" I.D. x 0.312" thick, with 0.750" dia. x 0.250" shoulder	Insulator, Pushing				1	887842-3	E-122	1	1	1	2	1 4
	E-123 to E-128	Not Used												
48	E-129	Insulator: bushing, bakelite, BM-262 natural, 7/16" O.D. x 0.180" I.D. x 0.250" thick with 0.280" dia. x 0.157" shoulder	Insulator, Bushing, P-A and Tripler				1	887842-2	E-129	1	1	3	2	6 12
	E-130	Not Used												

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TABLE 8-2
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MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																			
PARTS												SPARE PARTS							
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	EQUIP.	TENDER	BOX NO.	QUAN.	STOCK		
RECEIVER TRANSMITTER (Continued)																			
49	E-131	Insulator: bushing, bakelite, EM-262 natural, 0.359" O.D. x 0.120" I.D. x 0.125" thick, with 1.72" dia. x 0.047" shoulder	Insulator, Mounting Screw P-A				1	887842-1	E-131	1	1	1	1	1	1	1	16		
50	E-201	Shield: tube, for Type SO-11 socket and 6AX5 tubes or similar, 7/8" O.D. x 0.810" I.D. x 1-3/8" high inner spring, free length 5/8", approx. 3-1/2 turns	Shield, Tube V-201	JAN SOS-3 JAN S-28			755	99147-1	E-201, 202	2							5		
	E-202	Same as E-201	Shield, Tube V-202	JAN SOS-3					E-202	1									
	E-203	Not Used																	
	E-203A	Same as E-101A	Knob, Control for C-201						E-203A	1									
51	E-204	Terminal Assembly: consisting of one through terminal 15/16" long x 3/8" dia. stock and brass plate 15/16" wide x 0.125" thick, with four holes	Terminal, R-F Detector Output				1	886809-501	E-204	1							1		
52	E-205	Shield: 0.020" thick aluminum, 1-1/4" high x 1-1/8" long, with three slots 1" high x 0.020" wide, base 1/2" long x 5/16" deep, with hole 0.128" dia.	Shield, R-F Unit Interstage				1	888761-1	E-205	1							1		
53	E-206	Shield: 0.020" thick aluminum, 1-1/4" high x 1-1/8" long, with three slots 1" high x 0.020" wide, base 1/2" long x 5/16" deep, with hole 0.128" dia.	Shield, R-F Unit Interstage				1	888761-2	E-206	1							1		
	E-207	Not Used																	
54	E-208	Selector switch assembly: consisting of clutch assembly lever, lever plate, shaft, push rod, locking plate, ten selector discs and spacers, nine separator discs, end plate, ball bearing, plug, cage assembly, base plate assembly with gear knob assembly 0 to 100, back plate, and hardware	Switch, Tuning R-F				1	881729-504	E-208	1	1	1	1	1	2	2	1		

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS				
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS. JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	TENDER BOX NO.	STOCK ON HAND
RECEIVER TRANSMITTER (Continued)														
55	E-301 E-302 to E-308	Sleeve: beryllium copper, silver-plated, 0.718" long x 0.120" dia., 0.093" dia., hole for 1/4" one end, 0.005" max. gap slot for 0.375" other end, two holes 1/16" dia. in sides Not Used	Inner Conductor Terminal, Part of J-301				1	892835-1	E-301, 1002	2	2	1	1	2
56	E-309	Bracket assembly: consisting of one bracket 0.043" thick material 1-1/4" high x 5/8" wide x 33/64" deep, one nut, Qaintlock #4-40 and two through terminals	Bracket, Capacitor C-328				1	887817-501	E-309	1				5
	E-401A E-402 E-403A E-404A	Same as E-101A Not Used Same as E-101A Same as E-101A	Knob, Control for S-401 Knob, Control for R-432 Knob, Control for R-437						E-401A E-403A E-404A	1 1 1				
57	E-501	Shield: tube, for Type SO-11 socket and one T4 tube or similar, 7/8" O.D. x 0.840" I.D. x 1-3/8" high, inner spring free length 5/8", approx. 3-1/2 turns	Shield, Tube V-502	JAN SOS-6 JAN S-26			755	99147-2	E-501, 502, 503 513	4				5
	E-502 E-503 E-504 E-505	Same as E-501 Same as E-501 Insulator: disc, ceramic steatite, 5/32" thick x 3/8" O.D. x 0.125" I.D. Stud: terminal, brass, 15/16" long, head 5/16" long x 3/16" square with #4-40 tap, 7/32" deep, shank threaded 5/16" from end with #4-40 thread	Shield, Tube V-503 Shield, Tube V-505 Insulator, Converter Output Terminal Terminal, Converter Output	JAN SOS-6 JAN SOS-6 RE 13A 317			28 1	887849-1 887850-1	E-502 E-503 E-504 E-505	1 1 1 1		1 1 1 1	2 1 1 1	4 3 2 1

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																
PARTS										RECEIVER TRANSMITTER (Continued)						
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS					
											BOX NO.	QUAN.	BOX NO.	QUAN.	TENDER BOX NO.	STOCK QUAN.
60	E-506	Insulator: bushing, steatite, 0.375" O.D. x 0.425" I.D. x 1/4" thick, with 13/64" wide x 1/32" deep slot in top	Insulator, Converter Output Terminal	JAN-1-10			28	887863-1	E-506	1	1	1	1	1	1	2
61	E-507	Terminal assembly: consisting of brass plate 1-1/2" long x 1/2" wide x 0.0403" thick, two holes 0.147" dia., two holes 0.281" dia., two through terminals 15/16" long, hermetically sealed, glass insulation	Terminal, Multiplier Input				1	888133-501	E-507	1						1
62	E-508	Link assembly: consisting of a brass link Cerex block and bushing assembly 1-1/4" long x 1-7/16" high x 3/4" deep, less screw and washers, two holes tapped #6-32 threads on 0.875" mounting centers	Link, Multiplier Output				1	893908-501	E-508	1					2	1
63	E-509	Selector switch assembly: consisting of clutch assembly, lever, lever plate, shaft, push rod, locking plate, ten selector discs and spacers, nine separator discs, end plate, ball bearing, plug, cage assembly, base plate assembly with gear knob assembly 100-0, back plate, and hardware	Switch, Tuning Multiplier				1	881729-503	E-509	1	1	1	1	1	2	4
	E-510 to E-512	Not Used														
64	E-513	Same as E-501	Shield, Tube V-203	JAN SOS-6					E-513	1						
	E-514	Crystal oven: 24 pins, brass, silver-plated, 12 v a.c. or d.c., max. overall dimensions 3.642" long x 2.586" wide x 2.218" high	Oven, Crystal	-40148			218 Dwg. # RY 681 12A	433958-1	E-514	1	2	1				
65	E-601	Knob assembly: consisting of black molded compound knob 1-1/16" dia. x 7/8" thick with eight equally spaced indentations and pointer, brass insert 1/2" O.D. x 0.251" I.D. x 5/16" long, two #8-32 tapped holes	Knob, S-602				1	433571-501	E-601, 702	6						5
	E-602	Brush: electrical contact, positive, spring cap and pigtail 19/32" long x 0.266" dia., assembly 7/8" long	Brushes, Positive, B-602				1358 Dwg. # X-1746R	889582-1	E-602	1						

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS

PARTS			RECEIVER TRANSMITTER (Continued)					SPARE PARTS						
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AMS JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	EQUIP.	TENDER	STOCK NO.
66	E-603 Brush: electrical contact, negative, spring cap and pigtail 19/32" long x 0.266" dia., assembly 7/8" long	Brushes, Negative B-602				1358 Dwg. X-1746S	889582-2	E-603	1					20
67	E-604 Brush set: including brush, pigtail spring and cap for positive end of B-603	Brushes, for Positive End of Blower Motor B-603				1172	889583-1	E-604	1	2				2
68	E-605 Brush set: one set of four, with holder springs, for dynamotor D-801	Brushes, D-801				1	895060-501	E-605	1	2	5	1	10	20
68a	E-606 Insulator brush holder assembly: 1/2" O.D. x 9/16", long overall, brass nickel plated insert 0.305" dia. x 0.134" long	Brush Riggings, B-603				1172 B-2745	889586-1	E-606	2	2	2	1	4	6
69	E-607 Not Used													
69	E-608 Brush: negative 7/32" long x 0.184" dia. carbon spring 1/2" long x 17/64" over-all dia.	Brush Set, Negative, Blower Motor B-603				1172 B-2701	889583-2	E-608	1	1	5	2	10	1 20
70	H-101 Washer spring: phosphor bronze, 0.005" thick x 7/16" O.D. x 0.250" I.D. x 0.060" deep	Washer Spring, P-A Coupling Loop				1	99657-11	H-101	1	1	1	2	2	1 5
71	H-102 Gasket: molded neoprene, durometer 35 13/32, rectangular 20.051" long x 8.051" wide outside x 19.051" long x 7.051" wide inside, 21/64" thick	Gasket, Receiver Transmitter Panel				1	433538-1	H-102	1	1	1	2	2	1 4
72	H-103 Gasket: molded neoprene, durometer 35 13/32, rectangular 19.718" long x 7.718" wide outside x 18.750" long x 6.750" wide inside, 3/8" thick	Gasket, Receiver Transmitter Outer Cover				1	433538-3	H-103, 901	2	1	1	2	2	1 4
73	H-104 Gasket: molded neoprene, durometer 35 13/32, rectangular 13.048" long x 5.423" wide outside x 12.455" long x 4.830" wide inside, 1/4" thick	Gasket, Receiver Transmitter Selector Panel				1	433538-5	H-104	1	1	1	2	2	1 4
74	H-105 Spring: music wire 0.035" dia., cadmium plated, 9/32" I.D., 5/16" free length, 3-1/2 turns, approx. 3-1/2" developed length, right-hand wound, square ends and ground	Spring, S-101 Mounting Cap				308	865344-4	H-105, 201, 408, 409, 410, 602	6	1	7	2	14	1 28
75	H-106 Washer: stainless steel 0.0187" thick x 0.406" O.D. x 0.252" I.D.	Washer, S-101 Shaft Bearing Thrust				1	868141-18	H-106, 202, 411, 412, 413, 603	6					5 14
76	H-107 Sling: fiberglass, 5-1/2", free length, 3 lbs. pull to extend overall length 3/4", beyond free length, 1/8" I.D., eye in one end	Sling, V-101 Clamp Tube				308	895042-1	H-107	1	1	1	2	1	1 1
77	H-108 Washer: neoprene, durometer hardness 50 13/32, cross section 1/16" dia., 3/8" O.D. x 1/4" I.D.	Washer, Water Sealing, Outer, S-101				113	887824-1	H-108, 204, 419, 420, 421, 605	6	1	14	2	28	3 56

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										RECEIVER TRANSMITTER (Continued)									
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION.	AWS JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS								
											BOX NO.	EQUIP.	TENDER	STOCK	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.
78	H-109	Washer: neoprene, durometer hardness 50 15%, cross section 1/16" dia., 21/32" O.D. x 17/32" I.D.	Washer, Water Sealing, Inner, S-101				113	887824-2	H-109,205,422, 423,424,425, 606,707,708	9	1	7	2	14	3	2	14	3	28
79	H-110	Cap: duralumin, 11/16" hex. x 1/8" one end, 9/16" dia. x 3/8" other end, 1/2" high overall, hex. end tapped 1/4" with 15/32" threads, other end 0.257" hole	Cap, S-101 Mounting				1	887838-1	H-110,206,426, 432,433,611	7					5	7			
80	H-111	Spring: sterling silver, made from strip 35/64" long x 0.171" wide x 0.010" thick, bent at 7/32" to 9/32" high, 0.089" dia. hole in base	Spring, C-108 Condenser Shaft				1	887897-1	H-111,112	2	1	2	2	4	1	10			
	H-112	Same as H-111	Spring, C-106 Condenser Shaft						H-112	1									
81	H-113	Same as H-111 except opposite hand	Spring, C-108 Condenser Shaft				1	887897-2	H-113,114	2	1	2	2	4	1	10			
	H-114	Same as H-113	Spring, C-106 Condenser Shaft						H-114	1									
82	H-115	Bushing: aluminum, 9/16" thick, 3/4" wide, 1.7185" long, 15/32"-32 threads, two holes tapped #6-32 threads	Bushing, S-101 Mounting				1	433910-2	H-115,407,427, 428	4					5	4			
83	H-116	Gasket: neoprene, durometer 50, 3-13/16" long x 2-13/16" wide x 1/4" thick, inside opening 3-1/16" long x 2-1/16" wide, 12 holes 3/32" dia.	Gasket, for Front Panel				1	888782-1	H-116	1	1	1	2	2	1	4			
84	H-117	Washer: neoprene, durometer hardness 50 15%, cross section 3/32" dia., 23/32" O.D. x 17/32" I.D.	Washer, for J-301				1	887824-5	H-117	1	1	1	1	2	3	4			
85	H-118	Washer: neoprene, durometer hardness 50 15%, cross section 1/16" dia., 7/32" O.D. x 3/32" I.D.	Washer, Water Sealing				1	887824-6	H-118,715	2	1	8	1	16	3	32			
86	H-119	Washer: neoprene, durometer hardness 50 15%, cross section 1/16" dia., 1-15/64" O.D. x 1-7/64" I.D.	Washer, Water Sealing				1	887824-7	H-119,716	2	1	2	1	4	3	8			
87	H-120	Washer: neoprene, durometer hardness 50 15%, cross section 1/16" dia., 1-23/64" O.D. x 1-15/64" I.D.	Washer, Water Sealing				1	887824-8	H-120,717	2	1	3	1	6	3	18			
88	H-121	Screwdriver: Marine Corps green enamel finish 3-27/32" long overall x 1/2" wide x 1/8" thick shaft, tip 1/16" thick	Screwdriver				1361	887891-1	H-121	1	2	1	1	1	1	2			

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS									
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP.	TENDER	STOCK					
RECEIVER TRANSMITTER (Continued)																			
89	H-122	Spring Assembly: consisting of two springs made from 0.010" thick sterling silver, one 5/16" wide formed 7/8" long x 5/16" high, other 0.125" wide formed 23/64" long x 5/32" high	Spring, for Shaft of C-107				1	888945-501	H-122	1	1	1	2	1 5					
	H-201	Same as H-105	Spring, C-201 Mounting Cap						H-201	1									
	H-202	Same as H-106	Washer, C-201 Shaft Bearing Thrust						H-202	1									
90	H-203	Bushing: duralumin, 3/4" hex. x 11/32" thick, with 15/32"-32 thread, center hole 0.252" dia.	Bushing, C-201 Mounting				1	887271-1	H-203, 604	2				5 2					
	H-204	Same as H-108	Washer, Neoprene Water Sealing, Outer, C-201						H-204	1									
	H-205	Same as H-109	Washer, Neoprene Water Sealing, Inner, C-201						H-205	1									
91	H-206	Same as H-110	Cap, C-201 Mounting						H-206	1				5 1					
	H-207	Clamp: aluminum, 59/64" long x 17/32" wide x 0.031" thick overall, one hole 0.147" dia., one hole 0.281" dia.	Clamp, R-F Detector Output Bushing				1	888136-1	H-207	1				5 1					
92	H-208	Bushing: nickel-plated brass, 51/64" long x 5/8" wide x 0.250" thick overall two holes #4-40 taps x 1/8" long, one hole 3/64" dia. shaft hole 0.250" dia.	Bushing, Receiver Tuning Condenser				509	888156-1	H-208	1				5 1					
93	H-209	Bushing: nickel-plated brass 0.7655" long x 5/8" wide x 0.250" thick, one end bent up 3/16", two holes #4-40 tap x 1/8" long, shaft hole 0.250" dia.	Bushing, Receiver Tuning Condenser				509	888157-1	H-209	1				5 1					
94	H-210	Bushing assembly: consisting of glass bonded mica bushing 0.273" long x 3/8" dia. overall, brass eyelet 0.087" dia. x 0.318" long to H-305 Not Used	Bushing, R-F Detector Output Terminal	JAN I-10			1	888177-501	H-210, S10	2	1	2	2	4 3 8					
95	H-301	Clamp: aluminum, 29/32" long x 25/32" wide x 0.091" thick overall, 0.281" dia. hole, counterbore two holes 0.406" dia. x 0.062" deep, #6-32 tap	Clamp, I-F Input Bushing				1	888135-1	H-306	1				5 1					
96	H-307	Plate: aluminum, 29/32" long x 25/32" wide x 0.025" thick overall, one hole 0.281" dia., two holes 0.156" dia.	Plate, I-F Input Bushing, Mounting				1	888137-1	H-307	1				5 1					

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS				RECEIVER TRANSMITTER (Continued)										SPARE PARTS				
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AMS JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	TENDER	BOX NO.	QUAN.	STOCK		
97	H-401	Clamp: steel, zinc-plated, 2-1/4" long x 0.731" wide x 1.8125" high, two mounting slots 17/64" long x 5/32" wide on 1.875" x 1/4" centers	Clamp, C-407 Capacitor				1	90545-1	H-401, 402, 403 404	4						5		
	H-402	Same as H-401	Clamp, C-409 Capacitor						H-402	1								
	H-403	Same as H-401	Clamp, C-410 Capacitor						H-403	1								
	H-404	Same as H-401	Clamp, C-414 Capacitor						H-404	1								
	H-405	Clamp: steel, zinc-plated, 2-1/4" long x 0.731" wide x 1.000" high, two mounting slots 17/64" long x 5/32" wide on 1.875" x 1/4" centers	Clamp, C-408 Capacitor				1	90545-2	H-405, 406	2						5		
98	H-406	Same as H-405	Clamp, C-412 Capacitor						H-406	1								
	H-407	Same as H-115	Bushing, R-437 Mounting						H-407	1								
	H-408	Same as H-105	Spring, S-401 Mounting Cap						H-408	1								
	H-409	Same as H-105	Spring, R-437 Mounting Cap						H-409	1								
	H-410	Same as H-105	Spring, R-432 Mounting Cap						H-410	1								
99	H-411	Same as H-106	Washer, S-401 Shaft Bearing Thrust						H-411	1								
	H-412	Same as H-106	Washer, R-432 Shaft Bearing Thrust						H-412	1								
	H-413	Same as H-106	Washer, R-437 Shaft Bearing Thrust						H-413	1								
	H-414	Spring: 0.020" dia. music wire, 32 turns per inch, 13/16" I.D., 0.9985" O.D. spring, Z-402	Spring, Z-402 Seal Gasket				1	894319-1	H-414	1			1	4	1	8	4	20
	H-415	Gasket: neoprene, Grade FR water seal 0.958" O.D., 0.750" I.D. with hole in top 0.400" dia., 19/64" wide overall	Gasket, Z-402 Seal				1045 NO 32A41934	887545-1	H-415	1			1	4	1	8	4	12
100	H-416	Water seal assembly: consisting of shell and black bakelite plug, button, cap, hairpin loop and coil spring 1-9/32" long x 15/16" high x 13/16" wide overall	Seal, Z-402 Water				1235 Type XA 631866-G1	887546-1	H-416	1			1	4	1	8	4	16
101	H-417	Plate: aluminum, oval shaped, 0.064" thick x 3/4" wide at center x 1.7185" long with 0.390" dia. center hole and two slots 21/64" long x 0.156" wide each end	Plate, S-401 Mounting				1	887814-1	H-417	1						5		2

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																	
PARTS										SPARE PARTS							
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWG, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	TENDER	BOX NO.	QUAN.	STOCK	QUAN.
RECEIVER TRANSMITTER (Continued)																	
103	H-418	Plate: aluminum, oval shaped, 0.064" thick x 3/4" wide at center x 1.7185" long, with 0.391" dia. center hole with 1/16" x 1/32" keyway and two slots 21/64" long x 0.156" wide each end	Plate, R-431 Mounting				1	887814-2	H-418	1						5	1
	H-419	Same as H-108	Washer, Neoprene, Water Sealing, Outer, S-401						H-419	1							
	H-420	Same as H-108	Washer, Neoprene, Water Sealing, Outer, R-437						H-420	1							
	H-421	Same as H-108	Washer, Neoprene, Water Sealing, Outer, R-432						H-421	1							
	H-422	Same as H-109	Washer, Neoprene, Water Sealing, Inner, S-401						H-422	1							
	H-423	Same as H-109	Washer, Neoprene, Water Sealing, Inner, R-402						H-423	1							
	H-424	Same as H-109	Washer, Neoprene, Water Sealing, Inner, R-437						H-424	1							
	H-425	Same as H-109	Washer, Neoprene, Water Sealing, Inner, R-432						H-425	1							
	H-426	Same as H-110	Can, S-401 Mounting						H-426	1							
	H-427	Same as H-115	Bushing, R-432 Mounting						H-427	1							
	H-428	Same as H-115	Bushing, S-401 Mounting						H-428	1							
104	H-429	Washer: flat, Buna S 0.359" I.D., 3/4" O.D., 0.015" thick	Washer, Water Sealing, Outer, Z-402				1	60178-15	H-429, 711, 712, 713	4	1	3	1	3	4	6	
	H-430, 431	Not Used															
	H-432	Same as H-110	Cap, R-437 Mounting						H-432	1							
	H-433	Same as H-110	Cap, R-432 Mounting						H-433	1							
105	H-501	Clamp: tube, annealed spring steel, 0.040" thick material clamp end 7/16" wide x 9/16" long with seven teeth 1/32" high and center slot 0.150" wide x 15/64" long, stem end 1/8" wide x 3/4" high	Clamp, V-501				1	887827-1	H-501, 502	2	1	1	2	1	1	1	
	H-502	Same as H-501	Clamp, V-504						H-502	1							

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS				
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	RECEIVER TRANSMITTER (Continued)	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	EQUIP. TENDER	STOCK
115	I-601	Lamp: 6-8 V, 0.15 amp., 0.94 watt, bulb T-3-1/4" clear, miniature bayonet base, 1-1/8" long overall	Lamp, Filament Indicator				246 Mazda 47	61114-22	I-601	1	2	2	1	5
	J-101	Not Used												4
116	J-102	Connector: panel mounting receptacle 0.687" square plate with four holes 0.099"-56 tap 0.500 center line, body 0.725" long x 0.473" dia.	Jack, V-101 Output	UG 87/U RE 49F 244			699	719230-5	J-102	1	1	1	1	3
	J-103 to 105	Not Used												2
117	J-106	Connector: jack assembly, female contact, brass shell, silver plated, 0.957" long x 3/4" dia. overall, mounting plate near centers 1" square, with four mount- ing holes 0.0120" dia. on 23/32" centers	Jack, Antenna Panel				1	439193-501	J-106	1	2	1	1	2
118	J-201	Receptacle: with bakelite insulator, molded over terminal 0.021" dia. hole 11/64" deep in terminal #3, #8-32 threads 0.687" square x 0.780" long, four holes 0.102" dia., 0.500" on centers and two holes 3/64" dia., same as A/N type UG 87/U except for 0.102" dia. holes, molded insulator and hole in terminal	Jack, Receiver Input				1	433908-1	J-201	1	2	1	3	2
119	K-101	Switch assembly: antenna transfer consisting of housing assembly, coil assembly, contact assembly, contact spring, three receptacle assemblies and hardware	Relay, Antenna Transfer				1	722602-501	K-101	1	1	1	1	4
120	K-102	Relay: armature coil, 12 V, 250 ohms; contacts; two form "C" pileups, closed in one direction when coil not energized; to open before making contact on other side when coil is energized; nitrogen filled hermetically sealed case 2-3/16" long x 1.102" wide x 1.508" high, eight terminals extending 5/8" stenciled 1 to 8; three mounting studs #8-32 threads x 5/16" long	Relay, H-V Change-Over	AN-QQ-S91			713 Dwg. #FS-56	429680-1	K-102, 601	2	1	1	1	5

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS									
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWG-TAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOA NO.	QUAN.	EQUIP. TENDER STOCK	BOA NO.	QUAN.	UNAN.	BOX NO.	UNAN.	BOX NO.
RECEIVER TRANSMITTER (Continued)																			
	K-601	Same as K-102	Relay, Selector Control						K-601	1									
121	L-101	Coil assembly: consisting of right-hand coil, one turn, 0.0808" dia. wire formed 9/16" I.D., two terminals	Coil, Input Loop	-47870			1	888180-501	L-101	1		1	1						
122	L-102	Coil: 0.965" long, 7/8" high, 7/16" O.D., right-hand wound, four turns 0.0201" thick, 1/8" wide, copper sheet	Coil, V-101 Grid	-47869			1	888126-2	L-102	1		1	1						
123	L-103	Coil: 1.018" long, 1-7/64" high, 11/16" O.D. of wound coil, 0.047" dia. hole on center line on rear turn, right-hand wound, three turns 0.0201" thick, 3/16" wide, copper sheet	Coil, V-101 Plate	-47868			1	888126-1	L-103	1		1	1						
124	L-104	Coil: right-hand wound, one turn 0.1285" dia. wire formed 7/8" I.D.	Coil, V-101 Output Loop	-47867			1	888148-1	L-104	1		1	1						
125	L-105	Part of W-103	V-102 Input Loop						L-105	1		1	2						
	L-106	Connector assembly: consisting of socket for 2039 heater tube and feed assembly inductance, coaxial cable 8-1/2" long, single copper conductor AWG #22 vinylite insulation, with glass braid approx. 0.080" dia., outer covering copper tubing 0.100" dia., approx. 0.015" thick wall, including one connector assembly and an adapter	Coil, P-A Grid Tuning	-49884			1	439134-501	L-106	1		1	1						
126	L-106A	Inductance: AWG #20 covered with vinylite insulation, glass braid and copper tube 0.125" dia. overall, 4-59/64" long, 61/64" wide, developed length 8"	Inductance, P-A Grid Tuning				1	863951-1	L-106A	1		2	1						
127	L-107	Connector assembly: grid tuning coil tripler, consisting of a socket for a 2039 heater tube and feed assembly with tripler inductance, 12" long coaxial cable single copper conductor AWG #22 vinylite insulation, with glass braid approx. 0.080" dia., outer covering copper tubing 0.109" dia., 0.015" thick wall, including one other connector and one connector assembly and an adapter	Coil, V-102 Grid Tuning	-49883			1	433594-501	L-107	1		1	2						

TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS					
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AMS, JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	EQUIP.	TENDER	STOCK
RECEIVER TRANSMITTER (Continued)															
128	L-108	Part of Z-100B	Inductor, V-102 Plate Grid						L-108	1					
	L-109	Coil: radio, r-f loop 0.0641" dia. bare copper wire 1-3/8" long x 11/16" wide, with two-hole bakelite connector	Coil, V-102 Output Loop				1	889216-501	L-109	1	1	1	2	1	1
	L-110	Part of Z-100C	V-103 Input Loop						L-110	1					
	L-111	Part of Z-100C	Inductor, V-103 Grid Cathode						L-111	1					
	L-112	Part of Z-100C	Inductor, V-103 Plate Grid						L-112	1					
129	L-113	Loop assembly: consisting of 0.0403" dia. copper wire, loop 1" long x 15/32" wide less soldering ends, one terminal assembly, one brass gear, one styramic h.t. insulator and one aluminum support 1.687" long x 1.224" high x 1.302" deep overall	Loop, Antenna Coupling				1	433505-S01	L-113	1		1	1	3	1
130	L-114	Coil: r-f choke, integral type, single winding unshielded, 17-1/2 turns equally spaced AWG #20 copper wire 0.125" I.D., 0.157" O.D. x 13/16" long overall, two axial leads each 1/2" long	Choke, V-103 Filament				1	888936-1	L-114, 115	2		2	2	1	2
131	L-115	Same as L-114	Choke, V-103 Filament						L-115	1					
	L-301	Coil: r-f choke, integral type, molded, 45 turns AWG #30 E copper wire, natural resonant frequency above 50 mc, imped- ance 500 ohms at 50 mc, max. d-c resistance 0.3 ohm, 15/16" long x 1/4" dia. overall, two axial leads each 1-15/16" long, core 5/8" long x 3/16" dia.	Choke, R-F, V-301 Filament	-47810 JAN R-11			795	888776-1	L-301, 302, 303, 304, 305, 506, 507, 509	8	2	4	1	8	12
	L-302	Same as L-301	Choke, R-F, V-302 Filament	-47810					L-302	1					
	L-303	Same as L-301	Choke, R-F, V-303 Filament	-47810					L-303	1					

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																	
PARTS										SPARE PARTS							
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS. JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.	STOCK
RECEIVER TRANSMITTER (Continued)																	
132	L-304	Same as L-301	Choke, R-F, V-304 Filament	-47810					L-304	1							
	L-305	Same as L-301	Choke, R-F, V-305 Filament	-47810					L-305	1							
	L-501	Coil: r-f inductor coil converter, single winding, single layer wound, unshielded, three turns of 0.032" thick x 1/4" wide, copper, 3/8" pitch formed 0.498" I.D., approx. overall dia. x 3-5/16" approx. overall length	Coil, V-501 Plate Tuning				1	727334-501	L-501	1	2	1	1	2	2	3	3
133	L-502	Coil: r-f inductor, and tripler tuning, single winding, single layer wound, unshielded, two turns of 0.032" thick x 1/4" wide, copper, 3/8" pitch formed 0.498" I.D., 1-1/4" approx. overall dia. x 3-5/16" approx. overall length	Coil, V-502 Plate Tuning				1	727334-502	L-502	1	2	1	1	2	2	3	3
	L-503	Not Used															
134	L-504	Transformer assembly: enclosed in shield can, consists of coil 30 turns AWG #18 copper wire with an adjustable iron core, assembly bottom end, overall dimensions 1.375" square x 3.389" high excluding terminals at top, and core assembly bottom	Coil, V-504 Plate				1	618106-507	L-504	1	2	1	1	2	1	3	3
	L-505	Not Used															
	L-506	Same as L-301	Choke, R-F, V-504 Filament	-47810					L-506	1							
	L-507	Same as L-301	Choke, R-F, V-502 Filament Supply	-47810					L-507	1							
	L-508	Not Used															
	L-509	Same as L-301	Choke, R-F, V-503 Filament	-47810					L-509	1							

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS				
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AVS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP.	TENDER	STOCK
RECEIVER TRANSMITTER (Continued)														
135	M-101	Meter: output, 0 to 10 ma d.c., 100 ohms, 0.001 1/2 full scale amps., 1-3/4" square x 19/64" thick mounting flange, four mounting holes 1.312" between centers, black phenolic case 1.510" max. dia. x 13/16" max. thickness, dull black dial, white marking	Meter, Panel	-22504 ANS C39/2			246 8DN 1	430715-1	M-101	1				1
136	O-101	Gear: worm, stainless steel, 48 pitch, 0.333 pitch dia., single thread, right-hand 14-1/2" pressure angle, 0.065" lead, 3" 35' thread angle, 17/32" min. length of full thread, 0.373" O.D. x 0.1879" I.D. x 11/16" long	Worm Gear, Selector Drive				508	872512-1	O-101	1			2 3 3 6	
137	O-102	Needle bearing: steel, 1 1/32" overall dia. x 3/16" shaft dia. x 1/4" long	Bearing, Needle, Selector Drive Shaft, Horizontal				863 Type GB34X	886818-1	O-102, 103	2			2 4 3 4	
138	O-103	Same as O-102	Bearing, Needle, Selector Drive Shaft, Vertical				1	886874-1	O-103	1			5 2	
139	O-104	Shaft: stainless steel, 12" long x 0.1876" dia.	Shaft, Selector Drive, Horizontal				1	886876-1	O-104	1			5 4	
140	O-105	Collar: stainless steel, 1/4" thick x 3/8" O.D. with 1/4" x 1/16" hub 0.1879" I.D., one 0.047" dia. hole through one side only, and one tapped hole #4-40 threads	Collar, Selector Drive Shaft Horizontal				1	886876-1	O-105	1				
140	O-106	Gear: bevel drive, stainless steel, 48 pitch, 78 teeth, 1.625" pitch dia. 14-1/2" pressure angle, 1.667" overall dia., with 7/16" dia. hub, 0.281" overall width at hub	Gear, Main Selector Drive				695	887260-1	O-106	1			2 1 3 1	
141	O-107	Coupling assembly, consisting of: one stainless steel plate, one spacer, cloth base bakelite, and one brass flange, 1-1/16" O.D. face; 7/16" O.D. hub, 5/16" I.D. x 0.725" long overall, 3/16" r. protrusion extending 3/4" from I.D. center with 0.063" dia. hole 0.562" from I.D. center four 0.102" dia. holes equally spaced	Coupling, Dial 1st I-P-A				1	895883-501	O-107, 108, 109, 110	4			2 2 1 4	

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS				
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AMS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	QUAN.
RECEIVER TRANSMITTER (Continued)														
	O-108	Same as O-107	Coupling, Dial, and I-P-A						0-108	1				
	O-109	Same as O-107	Coupling, Dial, Antenna Coupling						0-109	1				
	O-110	Same as O-107	Coupling, Dial, Power Amplifier						0-110	1				
142	O-111, 116	Not Used												
143	O-117	Gear assembly: consisting of aluminum gear, 48 pitch, 111 teeth, 14-1/2" pressure angle, 2.3125" pitch dia., 2.3541" O.D., with six holes 1/2" dia. equally spaced on 1-3/8" dia. circle, brass hub 1/2" O.D. x 0.2500" I.D. x 0.280" thick	Gear, R-F Tuning Drive				1	887812-501	0-117	1		1	1	3
144	O-118	Gear: spur, aluminum, 48 pitch, 57 teeth, 14-1/2" pressure angle, 1.1875" pitch dia., 1.2291" O.D., with hub 9/16" O.D. x 0.1875" I.D. x 3/16" thick	Gear, R-F Tuning				1	887813-1	0-118	1		1	1	3
145	O-119	Not Used												
	O-120	Gear assembly: stainless steel, consist- ing of one spiral and one ring gear, approx. 0.391" dia. x 0.562" long	Selector Spiral Gear				1	886839-502	0-120	1	1	2	2	4
146	O-121	Gear assembly: consisting of laminated phenolic cloth base gear, 48 pitch, 57 teeth, 14-1/2" pressure angle 1.1875" pitch dia., 1.2291" O.D., with aluminum hub 13/32" O.D. x 9/16" wide x 0.2500" I.D.	Gear, R-F				1	887822-501	0-121	1		1	1	3
147	O-201	Coupling: flexible drive, duralumin 3/8" O.D. x 0.1875" I.D. x 1-1/8" long	Joint, Universal, C-201 Drive				86 T-41	868655-4	0-201	1	3	1	5	2

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS				
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP. TENDER	BOX NO.	QUAN.
RECEIVER TRANSMITTER (Continued)														
148	O-202	Shaft assembly: consisting of two dural shaft 1-3/32" long x 0.187" dia., laminated insulation, coupling 1" long x 7/16" dia., with 0.1895" hole 13/32" deep each end, two steel screws #6-32 x 1/8" long, two stainless steel taper pins #6/0 x 1/2" long, 2-13/32" overall length	Shaft, C-201 Tuning				1	888104-501	O-202	1			2	1
149	O-203	Gear assembly: consisting of aluminum support with two 1/2" dia. hubs, two stainless steel shafts, one 1" long x 0.187" dia., other 29/32" long x 0.2496" dia., overall, two brass miter gears 3/8" pitch dia., face 7/64", 48 pitch, 18 teeth, four setscrews 1/8" long #4-40	Gear, C-201 Drive				1	888125-501	O-203	1			2	1
150	O-204	Gear: aluminum, 0.7916" O.D. x 5/16" thick, 0.7500" pitch dia., 48 diametral pitch, 36 teeth, 14-1/2° pressure angle, hub 7/16" dia., bore 0.1875" dia.	Gear, R-F Tuning Condenser				1	888528-2	O-204	1			3	1
151	O-205	Gear assembly: consisting of aluminum gear 0.7916" O.D. x 0.249" thick, 0.7500" pitch dia., 48 diametral pitch 36 teeth, 14-1/2° pressure angle, hub 5/16" dia., bore 0.1875" dia., stainless steel plate 0.032" thick, stock 15/64" wide x 37/64" long to center of mounting holes	Gear, Driven, R-F Tuning Condenser				1	888548-501	O-205	1			3	1
152	O-206	Coupling assembly: consisting of two plate assemblies, bushing, shim and spring, approx. 1-1/2" dia. x 0.328" thick	Coupling, R-F Receiver					433932-501	O-206	1			2	1
153	O-501	Gear assembly: consisting of two gears, stainless steel, 1.500" pitch dia., 48 diametral pitch, 72 teeth, 14-1/2° pressure angle, 0.037" thick x 1.5416" O.D., complete with stainless steel pin; one gear with 0.3745" O.D. hole, other with 0.314" hex. hole for shaft, shim, spring, and hub, stainless steel, 1/2" O.D. x 0.250" I.D. x 0.392" long; overall size 1.5416" dia. x 0.392" thick	Gear, Multiplier Tuning Condenser				1	433931-501	O-501	1			3	1

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT															
PARTS				RECEIVER TRANSMITTER (Continued)											
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS				
											BOX NO.	EQUIP.	TENDER	STOCK	
											BOX NO.	QUAN.	BOX NO.	QUAN.	
154	O-502	Gear assembly: consisting of two gears, stainless steel, 1.500" pitch dia., 48 diametral pitch, 72 teeth, 14-1/2° pressure angle, 0.037" thick x 1.5416" O.D., complete with stainless steel pin; one gear with 0.3745" O.D. hole, other with 0.314" hex. hole for shaft, shim, spring and bushing, stainless steel 1/2" O.D. x 0.253" I.D. x 0.328" long; overall size 1.5416" dia. x 0.328" thick	Gear, Multiplier Tuning Condenser				1	433931-502	0-502	1			3	1 5 1	
155	O-503	Gear: aluminum, 2.5416" O.D. x 0.375" thick, 2.500" pitch dia., 48 diametral pitch, 120 teeth, 14-1/2° pressure angle, hub 7/16" dia.; bore 0.1874" dia., six holes 1/2" dia. on 1-1/4" centers	Gear, Multiplier Tuning				695	888529-1	0-503	1			3	1 2 1	
156	O-504	Shaft: stainless steel, 5/8" long x 5/16" dia. overall with 0.1562" dia. 3/32" long hole one end	Shaft, Multiplier Tuning Condenser				1	888524-1	0-504	1				5 1	
	O-505 to O-507	Not Used													
157	O-508	Coupling assembly: consisting of two plate assemblies, bushing, shim and spring approx. 1-1/2" dia. x 0.376" thick	Coupling, Multiplier Driver					433932-502	0-508	1			2	1 3 1	
158	O-601	Coupling assembly: consisting of stainless steel shaft 31/32" long x 0.249" dia. with cap 5/8" dia. x 0.062" thick, stainless steel, coupling disc 0.032" thick, stock 1-5/8" dia. x 1/4" high	Coupling, Switch S-602				1	888752-501	0-601	1			2	1 3 1	

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
WAR RADIO EQUIPMENT

PARTS										SPARE PARTS					
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	EQIP.	TENDER	STOCK
RECEIVER TRANSMITTER (Continued)															
159	O-602	Bearing: ball, 0.8659" O.D., 0.27545" I.D., 0.2731" wide with seven balls 5/32" dia. each	Bearing Set, R-602				439 NO-77037	885655-7	0-602	1	2	1	2	1	1
160	O-603	Bearing: ball, single row radial, steel, bore 0.2500" O.D., 0.6250" width, 0.1969" overall, having eight 3/32" dia. balls	Bearing, R-603 Blower Motor				439 7-R-4	885655-10	0-603	1	2	1	1	1	1
161	O-604	Bearing: ball, single row radial shield, steel, bore 0.2362" x 0.7480" overall x 0.2362" wide overall	Bearing, D-801				439 Brz. NO-7036	885824-3	0-604	1	2	2	1	2	2
162	O-605	Not Used													
163	O-606	Wheel: blower, spare	Blower Wheel, Motor R-603				1172	889588-1	0-606	1	2	1	1	2	3
	O-607	Wheel: blower, spare	Blower Wheel, Dynamotor D-801				670	889589-1	0-607	1	2	1	1	2	3
164	O-608 to O-610	Not Used													
	O-611	Bearing: ball, 0.6297" O.D. x 0.15735" I.D. x 0.1944" wide, with six 1/8" dia. balls	Bearing, Commutator End of R-602				439	885655-8	0-611	1	1	1	2	1	3
165	O-612	Cap set: contact brush, brass, 7/64" long x 9/32" dia., 5/16"-32 threads, slot in top 1/32" wide x 1/32" deep	Brush Holder Cap, for Blower Motor R-603				1172 1235	887560-1	0-612	1	1	2	2	4	6

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
HAR RADIO EQUIPMENT

PARTS																
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS						
										EQUIP.	TENDER	STOCK	QUAN.	BOX NO.	QUAN.	BOX NO.
666	R-101 Resistor, fixed, carbon, 5600 ohms $\pm 10\%$, 1 watt, 9/16" long x 7/32" dia., two axial wire leads 1-1/2" long	Resistor, V-101 Grid Leak	JAN RC20BF-223K			722 Type GB	90495-71	R-101	1	2	1	3	4	5		
662	R-102 Resistor, fixed, carbon, 15,000 ohms $\pm 10\%$, 1 watt, 9/16" long x 7/32" dia., two axial wire leads 1-1/2" long	Resistor, V-101 Grid to Grid Shunt	JAN RC20BF-223K			722 Type GB	90496-76	R-102	1	2	1	3	4	5		
667	R-103 Resistor: fixed, composition, 150 ohms $\pm 5\%$, 5 watt, vitreous enamel covered, fired on ceramic coil and grooved, 2" long x 5/8" dia., with two radial leads 1-3/4" long	Resistor, V-101 Cathode	-633036-5			738 Type SX	891832-13	R-103	1	1	1	1	3	4	5	
672	R-104 Resistor, fixed, composition, 10,000 ohms $\pm 5\%$, 5 watts, 2" max. long x 5/8" max. dia., two axial wire leads 1-3/4" long	Resistor, V-101 Screen	-633032			738 Type SX	891832-5	R-104	1	1	1	1	3	5		
668	R-105 Resistor: fixed, wire wound, insulated, 1.59 ohms $\pm 2\%$, 1/4 watt, 3/8" long, 11/64" dia., two axial wire leads 1-1/2" long, temp. coeff. 0.002%/°C.	Resistor, V-101 Meter Shunt				1371 Type WRI-1/4	894379-1	R-105	1	1	1	1	3	4	5	
669	R-106 Resistor: fixed, composition, 500 ohms $\pm 5\%$, 5 watts, vitreous enamel covered, fired on ceramic coil and grooved, 2" long x 5/8" dia., with two radial leads 1-3/4" long	Resistor, V-103 Grid Leak	-633038-5			738 Type SX	891832-15	R-106	1	1	1	1	3	4	5	
670	R-107 Resistor: fixed, composition, 10,000 ohms $\pm 5\%$, 5 watts, vitreous enamel covered, fired on ceramic coil and grooved, 2" long x 5/8" dia., with two radial leads 1-3/4" long	Resistor, V-102 Grid Leak	-633032-5			738 Type SX	891832-5	R-107	1	1	1	1	3	4	5	
671	R-108 Resistor: fixed, wire wound, insulated, 3.03 ohms $\pm 2\%$, 1/4 watt, 3/8" long, 11/64" dia., two wire axial leads 1-1/2" long, temp. coeff. 0.002%/°C.	Resistor, V-102 Meter Shunt				1371 Type WRI-1/4	894379-2	R-108	1	1	1	1	6	10		
672	R-109 Resistor: fixed, wire wound, insulated, 4.95 ohms $\pm 2\%$, 1/4 watt, 3/8" long, 11/64" dia., two axial wire leads 1-1/2" long, temp. coeff. 0.002%/°C.	Resistor, V-103 Meter Shunt				1371 Type WRI-1/4	894379-3	R-109, 426, 427	3	1	1	1	6	10		

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																
PARTS										RECEIVER TRANSMITTER (Continued)						
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AMS JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS					
											BOX NO.	QUAN.	BOX NO.	QUAN.	TENDER BOX NO.	STOCK QUAN.
173	R-110	Resistor: fixed, wire wound, insulated, 15.78 ohms $\pm 2\%$, 1/4 watt, 3/8" long x 11/64" dia., two axial wire leads 1-1/2" long, temp. coeff. 0.002%/°C.	Resistor, V-102 Meter Shunt				1371 Type WRI- 1/4	894379-5	R-110	1	2	1	2	3	2	5
174	R-111	Not Used														
174	R-112	Resistor: fixed, wire wound, insulated, 6.12 ohms $\pm 2\%$, 1/4 watt, 3/8" long x 11/64" dia., two axial wire leads 1-1/2" long, temp. coeff. 0.002%/°C.	Resistor, V-103 Meter Shunt				1371 Type WRI- 1/4	894379-4	R-112	1	2	1	2	3	2	5
174a	R-113, 114	Not Used														
174b	R-115	Resistor: fixed, composition, 56 ohms $\pm 10\%$, 2 watts, 1.41" max. long x 0.405" max. dia., two axial wire leads 1.5" long	Bias Supply Voltage Divider	JAN RC40BF-560K JAN-R-11			795	722352-47	R-115	1		1	1	3		5
174b	R-116	Resistor: fixed, composition, 150 ohms $\pm 10\%$, 2 watts, 1.41" max. long x 0.405" max. dia., two axial wire leads 1.5" long	Bias Supply Voltage Divider	JAN RC40BF-150K JAN-R-11			795	722352-52	R-116	1		1	1	3		5
175	R-201	Resistor: fixed, composition, 0.22 megohms $\pm 10\%$, 1/2 watt, insulated, small, 0.468" max. length, 0.249" max. dia., two axial wire leads 1-1/2" long	Resistor, V-201 Grid Filter	JAN RC20BF-220K JAN-R-11			1	722318-90	R-201, 205, 206, 322, 409, 705	6		4	1	21	4	35
176	R-202	Resistor: fixed, composition, 3300 ohms $\pm 10\%$, 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-201 Grid	JAN RC20BF-330K JAN-R-11			722	722318-68	R-202	1	2	1	3	3	5	5
177	R-203	Resistor: fixed, composition, 56,000 ohms $\pm 10\%$, 1 watt, insulated, small, 0.718" max. length x 0.280" max. dia., with two axial wire leads 1.5" long	Resistor, V-201 Screen Droning	JAN RC30BF-56K JAN-R-11			722	722333-83	R-203	1	2	1	3	3	5	5
178	R-204	Resistor: fixed, composition, 1500 ohms $\pm 10\%$, 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-201 Plate	JAN RC20BF-150K JAN-R-11			722	722318-64	R-204, 320, 405	3	1	2	1	9	2	15
	R-205	Same as R-201	Resistor, V-202 Grid Filter	JAN RC20BF-220K					R-205	1						
	R-206	Same as R-201	Resistor, V-202 Grid	JAN RC20BF-220K					R-206	1						
179	R-207	Resistor: fixed, composition, 33,000 ohms $\pm 10\%$, 1/2 watt, insulated, small, 0.648" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-203 Grid	JAN RC20BF-330K JAN-R-11			722	722318-80	R-207	1	1	1	1	3	2	5

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																
PARTS			RECEIVER TRANSMITTER (Continued)										SPARE PARTS			
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	EQUIP. TENDER	BOX NO.	QUAN.	STOCK
180	R-208	Resistor: fixed, composition, 0.33 megohm 110 Ω , 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-202 Screen Dropping	JAN RC20BF- 334K JAN R-11			722	722318-92	R-208, 711	2	1	1	1	6	2	10
181	R-209	Resistor: fixed, composition, 10,000 ohms 110 Ω , 1 watt, insulated, small, 0.750" max. length x 0.280" max. dia., two axial wire leads 1.5" long	Resistor, V-203 Plate Shunt	JAN RC30BF- 103K JAN R-11			722	722333-74	R-209, 213	2	1	1	2	6	3	10
182	R-210	Resistor: fixed, composition, 270 ohms 110 Ω , 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-201 Cathode	JAN RC20BF- 271K JAN R-11			722	722318-55	R-210, 212, 303, 307, 311, 314	6	1	3	1	18	2	30
183	R-211	Resistor: fixed, composition, 1000 ohms 110 Ω , 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-202 Cathode	JAN RC20BF- 102K JAN R-11			722	722318-62	R-211	1	1	1	1	3	2	5
	R-212	Same as R-210	Resistor, V-203 Cathode	JAN RC20BF- 271K					R-212	1						
	R-213	Same as R-209	Resistor, V-202 Plate Shunt	JAN RC20BF- 103K					R-213	1						
184	R-301	Resistor: fixed, composition, 56,000 ohms 110 Ω , 1/2 watt, insulated, small, 0.468" max. length, 0.249" max. dia., two axial wire leads 1-1/2" long	Resistor, Z-301 Plate Filter	JAN RC20BF- 563K JAN R-11			1	722318-83	R-301, 420	2	1	1	1	6	2	10

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS				
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWG, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	QUAN.
RECEIVER TRANSMITTER (Continued)														
185	R-302	Resistor: fixed, composition, 0.10 megohm 110 Ω , 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-301 Grid Filter	JAN RC20BF- 104K JAN R-11			722	722318-86	R-302, 306, 310, 401 402, 413	6	1	3	1	18
	R-303	Same as R-210	Resistor, V-301 Cathode	JAN RC20BF- 271K					R-303	1				
186	R-304	Resistor: fixed, composition, 2200 ohms 110 Ω , 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-301 Screen Dropping	JAN RC20BF- 222K JAN R-11			722	722318-66	R-304, 305, 308, 309, 312, 313, 315, 316, 408	9	1	5	1	27
	R-305	Same as R-304	Resistor, V-301 Plate Dropping	JAN RC20BF- 222K					R-305	1				
	R-306	Same as R-302	Resistor, V-302 Grid Filter	JAN RC20BF- 104K					R-306	1				
	R-307	Same as R-210	Resistor, V-302 Cathode	JAN RC20BF- 271K					R-307	1				
	R-308	Same as R-304	Resistor, V-302 Screen Dropping	JAN RC20BF- 222K					R-308	1				
	R-309	Same as R-304	Resistor, V-302 Plate Dropping	JAN RC20BF- 222K					R-309	1				
	R-310	Same as R-302	Resistor, V-303 Grid Filter	JAN RC20BF- 104K					R-310	1				
	R-311	Same as R-210	Resistor, V-303 Cathode	JAN RC20BF- 271K					R-311	1				
	R-312	Same as R-304	Resistor, V-303 Screen Dropping	JAN RC20BF- 222K					R-312	1				

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COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT															
PARTS										SPARE PARTS					
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	EQUIP.	TENDER	STOCK ON HAND
RECEIVER TRANSMITTER (Continued)															
	R-313	Same as R-304	Resistor, V-303 Plate Dropping	JAN RC20BF-222K					R-313	1					
	R-314	Same as R-210	Resistor, V-304 Cathode	JAN RC20BF-271K					R-314	1					
	R-315	Same as R-304	Resistor, V-304 Screen Dropping	JAN RC20BF-222K					R-315	1					
	R-316	Same as R-304	Resistor, V-304 Plate Dropping	JAN RC20BF-222K					R-316	1					
187	R-317	Resistor: fixed, composition, 1.0 megohm $\pm 10\%$, 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-305 A.V.C. Filter	JAN RC20BF-105K JAN R-11			722	722318-98	R-317, 318, 406, 407	4	1	2	1	12	2 20
	R-318	Same as R-317	Resistor, V-305 A.V.C. Filter	JAN RC20BF-105K					R-318	1					
188	R-319	Resistor: fixed, wire wound, insulated, 200 ohms $\pm 1\%$, 1/4 watt, 3/8" long, 11/64" dia., two axial wire leads 1-1/8" long, temp. coeff. 0.002%/°C.	Resistor, V-303 Meter Shunt				1371 Tyne WRI-1/4	894379-6	R-319	1	2	1	3	3	5 5
189	R-320	Same as R-204	Resistor, V-304 Plate Dropping	JAN RC20BF-152K					R-320	1					
	R-321	Resistor: fixed, composition, 470 ohms $\pm 10\%$, 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-301 and V-302 Plate Dropping	JAN RC20BF-471K JAN R-11			207	722318-58	R-321	1	1	1	1	3	2 5
	R-322	Same as R-201	Resistor, V-305 Cathode	JAN RC20BF-224K					R-322	1					
190	R-323	Resistor: fixed, composition, 10,000 ohms $\pm 10\%$, 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-201 A.V.C. Filter	JAN RC20BF-103K JAN R-11			722	722318-74	R-323	1	1	1	1	3	2 5
191	R-324	Resistor: fixed, composition, 22,000 ohms $\pm 10\%$, 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial leads 1.5" long	Resistor, V-305 A.V.C. Delay	JAN RC20BF-223K JAN R-11			722	722318-78	R-324, 423, 509	1	1	2	1	9	2 15

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COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS				
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWG, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MPR. AND MPR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP. TENDER	BOX NO.	QUAN.
RECEIVER TRANSMITTER (Continued)														
192	R-325	Resistor: variable, carbon, 1500 ohms 110%, 2 watt, 3 terminals, body 1-1/8" dia. x 9/16" wide, shaft 0.250" dia. x 9/16" long	Resistor, V-301 Bias Control	-633232-10			722 Type "J"	430116-9	R-325	1	2	1	2	3
	R-401	Same as R-302	Resistor, V-305 Detector Load	JAN RC20BF- 104K					R-401	1				
	R-402	Same as R-302	Resistor, V-305 Detector Load	JAN RC20BF- 104K					R-402	1				
193	R-403	Resistor: fixed, composition, 0.47 megohm 110%, 1/2 watt, insulated, small, 0.468" max. length x 0.240" max. dia., with two axial wire leads 1.5" long	Resistor, V-401 Filter	JAN RC20BF- 474K JAN R-11			722	722318-94	R-403, 404 416, 512	4	1	2	1	12
	R-404	Same as R-403	Resistor, V-401 Filter	JAN RC20BF- 474K					R-404	1				
	R-405	Same as R-204	Resistor, V-402 Bleeder	JAN RC20BF- 152K					R-405	1				
	R-406	Same as R-317	Resistor, V-402 Squelch Grid	JAN RC20BF- 105K					R-406	1				
	R-407	Same as R-317	Resistor, V-402 1st A-F Grid	JAN RC20BF- 105K					R-407	1				
	R-408	Same as R-304	Resistor, V-402 Cathode Drooping	JAN RC20BF- 222K					R-408	1				
	R-409	Same as R-201	Resistor, V-402 Squelch Plate	JAN RC20BF- 224K					R-409	1				
194	R-410	Not Used												
	R-411	Resistor: fixed, composition, 15,000 ohms 110%, 4 watts, non-insulated, 2.66" max. length, 0.730" max. dia., two radial wire leads 1-1/2" long	Resistor, I-F Plate Drooping	JAN RC65CE- 153K JAN R-11			722	722365-76	R-411	1	2	1	3	3
195	R-412	Resistor: fixed, composition, 4700 ohms 15%, 5 watt, vitreous enamel covered, fired on ceramic coil and grooved 2" long x 5/8" dia., with two radial wire leads 1-3/4" long	Resistor, Bleeder	-633033-5			738 Type 5X	891832-6	R-412, 415, 422	3	2	2	3	9

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MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																							
PARTS												SPARE PARTS											
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR(S) DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	EQUIP.	TENDER	STOCK BOX NO.	QUAN.							
RECEIVER TRANSMITTER (Continued)																							
	R-413	Same as R-302	Resistor, V-402 Plate	JAN RC20BF-104K					R-413	1													
196	R-414	Resistor: fixed, composition, 82,000 ohms $\pm 10\%$, 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-402 Plate Drooping	JAN RC20BF-823K JAN R-11			722	722318-85	R-414	1	2	1	3	3	5	5							
	R-415	Same as R-412	Resistor, Bleeder	-633033-5					R-415	1													
	R-416	Same as R-403	Resistor, V-403 Grid	JAN RC20BF-474K					R-416	1													
197	R-417	Resistor: fixed, composition, 820 ohms $\pm 10\%$, 1/2 watt, insulated, large, 0.655" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-403 Cathode	JAN RC21BE-821K JAN R-11			722	722322-61	R-417	1	2	1	3	3	5	5							
198	R-418	Resistor: fixed, composition, 12,000 ohms $\pm 10\%$, 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-402 Bleeder	JAN RC20BF-123K JAN R-11			722	722318-75	R-418	1	1	1	1	3	2	5							
199	R-419	Resistor: fixed, composition, 27,000 ohms $\pm 10\%$, 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-402 Bleeder	JAN RC20BF-273K JAN R-11			722	722318-79	R-419	1	1	1	1	3	2	5							
	R-420	Same as R-301	Resistor, V-402 Bleeder	JAN RC20BF-563K					R-420	1													
200	R-421	Resistor: fixed, composition, 0.15 megohm $\pm 10\%$, 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-403 Side Tone	JAN RC20BF-154K JAN R-11			722	722318-88	R-421	1	1	1	1	3	2	5							
	R-422	Same as R-412	Resistor, Bleeder	-633033					R-422	1													
	R-423	Same as R-324	Resistor, V-402 A-F Filter	JAN RC20BF-223K					R-423	1													

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																
PARTS										SPARE PARTS						
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	EQUIP. TENDER	BOX NO.	QUAN.	STOCK NO.	
RECEIVER TRANSMITTER (Continued)																
201	R-424	Resistor: fixed, composition, 8100 ohms $\pm 1\%$, 1/2 watt, 5/8" long x 3/8" dia., two radial conner tinned wire leads 1-9/16" long	Resistor, Meter Multiplier			738 Type 1/2-X	895050-2	R-424	1	2	1	1	1	3	2	5
202	R-425	Resistor: fixed, composition, 8000 ohms $\pm 1\%$, 1/2 watt, 5/8" long x 3/8" dia., two radial conner tinned wire leads 1-9/16" long	Resistor, Meter Multiplier			738 Type 1/2-X	895050-1	R-425	1	2	1	1	1	3	2	5
	R-426	Same as R-109	Resistor, V-501 Meter Shunt					R-426	1							
	R-427	Same as R-109	Resistor, V-502, 503 & 504 Meter Shunt					R-427	1							
	R-428 to R-431	Not Used														
203	R-432	Resistor, variable, composition, 500,000 ohms $\pm 10\%$, 2 watts, 1-1/8" dia. x 9/16" thick, shaft 0.250" dia. x 1-1/4" long	Resistor, V-202 Grid Volume Control	-633233-10		722 Type "J"	430116-6	R-432	1	2	1	3	3	5	5	
204	R-433	Resistor: fixed, composition, 3000 ohms $\pm 5\%$, 1/4 watt, insulated, 0.406" max. length x 0.170" max. dia., two axial wire leads 1-1/2" long	Resistor, Voltmeter Shunt	JAN RC10BE-302J JAN R-11		722	722302-170	R-433	1	2	1	3	3	5	5	
205	R-434	Resistor: fixed, wire wound, insulated, 200 ohms $\pm 1\%$, 1/4 watt, 3/8" long x 11/64" dia., two axial wire leads 1-1/2" long, temp. coeff. 0.002%/°C.	Resistor, Meter Multiplier			1371 Type WRI-1/4	894379-7	R-434	1	2	1	2	3	2	5	
	R-435, 436	Not Used														
206	R-437	Resistor: variable, composition, 25,000 ohms $\pm 10\%$, 2 watts, 1-1/8" dia. x 9/16" thick, shaft 0.250" dia. x 1-1/4" long	Resistor, Silence Level Control Potentiometer	-633234-10		722 Type "J"	430116-8	R-437	1	2	1	3	3	5	5	
207	R-501	Resistor: fixed, composition, 820 ohms $\pm 5\%$, 1 watt, insulated, small, 0.718" max. length x 0.280" max. dia., with two axial wire leads, 1.5" long	Resistor, V-501 Plate Dropping	JAN RC50BF-821J JAN R-11		722	722333-157	R-501	1	1	1	1	3	2	5	

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COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																
PARTS										SPARE PARTS						
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	STOCK
RECEIVER TRANSMITTER (Continued)																
214	R-514	Resistor: fixed, composition, 1000 ohms ±5%, 1 watt, insulated, small, 0.718" max. length x 0.280" max. dia., with two axial wire leads 1.5" long	Resistor, V-501 Plate Dropping	JAN RC30BF- 102J JAN R-11			722	722333-159	R-514	1	2	1	3	3	5	5
	R-515, 516	Not Used														
215	R-517	Resistor, fixed, composition, 15,000 ohms ±5%, 1 watt, insulated, small, 0.718" max. length x 0.280" max. dia., with two axial wire leads 1.5" long	Resistor, V-501 Screen	JAN RC30BF- 153J JAN R-11			321	722333-187	R-517	1	2	1	3	3	5	5
	R-518	Same as R-510	Resistor, V-505 Plate Dropping	JAN RC30BF- 332J					R-518	1						
216	R-519	Resistor: fixed, composition, 18,000 ohms ±5%, 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-505 Grid	JAN RC20BF- 183J JAN R-11			722	722318-189	R-519	1	2	1	3	3	5	5
217	R-520	Resistor: fixed, composition, 680 ohms ±5%, 1/2 watt, insulated, small, 0.648" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-505 Cathode	JAN RC20BF- 681J JAN R-11			722	722318-155	R-520	1	2	1	3	3	5	5
218	R-521	Resistor: fixed, composition, 10,000 ohms ±10%, 2 watts, insulated, small, 1.41" max. length x 0.405" max. dia., with two axial wire leads 1.5" long	Resistor, V-502 Plate Dropping	JAN RC40BE- 103K JAN R-11			321	722352-74	R-521, 522	2	2	1	3	6	5	10
	R-522	Same as R-521	Resistor, V-502 Plate Dropping	JAN RC40BE- 103K					R-522	1						
219	R-523	Resistor: fixed, composition, 1600 ohms ±10%, 1 watt, insulated, small, 0.718" max. length x 0.280" max. dia., with two axial wire leads 1.5" long	Resistor, V-503 Plate Dropping	JAN RC30BF- 182K JAN R-11			321	722333-65	R-523	1	2	1	3	3	5	5
220	R-601	Resistor: fixed, Discomb, 3000 ohms ±5%, 1-3/8" O.D., 3/8" thick, 3/16" dia. hole, with 13/32" dia. countersunk 1/8" deep in center, two terminals lugs	Resistor, Selector Motor Lines				752	895024-1	R-601	1		1			3	5

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

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PARTS										SPARE PARTS						
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	EQUIP.	TENDER	STOCK NO.	
RECEIVER TRANSMITTER (Continued)																
208	R-502	Resistor: fixed, composition, 10,000 ohms ±5%, 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-501 Grid	JAN RC20BF- 103J JAN R-11			722	722318-183	R-502	1	1	1	1	1	3	2 5
209	R-503	Resistor: fixed, composition, 2700 ohms ±5%, 1 watt, insulated small, 0.718" max. length x 0.280" max. dia., with two axial wire leads 1.5" long	Resistor, V-501 Grid Filter	JAN RC30BF- 272J JAN R-11			722	722333-169	R-503	1	1	1	1	1	3	2 5
209a	R-504	Resistor: fixed, composition, 680 ohms ±5%, 1 watt, insulated, small, 0.750" max. long x 0.280" max. dia., two axial wire leads 1.50" long	Plate Filters, V-502	JAN RC30BF- 681J JAN R-11			722	722333-155	R-504	1	1	1	1	1	3	2 5
209b	R-505	Not Used														
209c	R-506	Resistor: fixed, composition, 47,000 ohms ±5%, 1/2 watt, insulated, small, 0.468" max. long x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, Grid Filter, V-502	JAN RC20BF- 473J JAN R-11			722	722318-199	R-506	1	2	1	3	3	4 5	
209d	R-507	Resistor: fixed, composition, 1500 ohms ±5%, 1 watt, insulated, small, 0.750" max. long x 0.280" max. dia., two axial wire leads 1.50" long	V-503 Plate Drooping	JAN RC30BF- 152J JAN R-11			722	722333-163	R-507	1	2	1	3	3	5 5	
210	R-508	Resistor: fixed, composition, 0.10 megohm ±5%, 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-503 Grid	JAN RC20BF- 104J JAN R-11			722	722318-207	R-508, 710, 712	3	2	3	3	15	5 25	
211	R-509	Same as R-324	Resistor, V-503 Grid Filter	JAN RC20BF- 223K JAN R-11					R-509	1						
211	R-510	Resistor: fixed, composition, 3300 ohms ±5%, 1 watt, insulated, small, 0.718" max. length x 0.280" max. dia., two axial wire leads 1-1/2" long	Resistor, V-504 Plate Drooping	JAN RC30BF- 332J JAN R-11			722	722333-171	R-510, 518	2	1	1	1	6	2 10	
212	R-511	Resistor: fixed, composition, 150 ohms ±10%, 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., with two axial wire leads 1.5" long	Resistor, V-504 Cathode	JAN RC20BF- 151K JAN R-11			722	722318-52	R-511	1	1	1	1	1	3 2 5	
213	R-512	Same as R-403	Resistor, V-504 Grid	JAN RC20BF- 474K JAN R-11					R-512	1						
213	R-513	Resistor: fixed, composition, 47,000 ohms ±5%, 1 watt, insulated, small, 0.718" max. length x 0.280" max. dia., with two axial wire leads 1.5" long	Resistor, V-504 Screen	JAN RC30BF- 473J JAN R-11			722	722333-199	R-513	1	1	1	1	1	3 2 5	

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT														
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS. JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS			
											EQUIP.	TENDER	STOCK	QUAN.
RECEIVER TRANSMITTER (Continued)														
221	S-101	Switch: rotary, two ceramic wafers, 12 positions, spring silver alloy, contacts solid silver, rotor blades, shaft 1-1/4" long x 0.250" dia. bushing 3/8"-32 threads	Switch, Voltmeter Selector				451	433522-1	S-101, 101A, 101B	3	1	1	1	4
	S-101A	Part of S-101	Switch, Wafer, Front						S-101A	1				
	S-101B	Part of S-101	Switch, Wafer, Rear						S-101B	1				
222	S-401	Switch: rotary, S.P.S.T., 1 amp., 250 V, 3 amps., 125 V, 1-9/32" wide x 1-27/32" long x 3/4" thick, shaft 0.250" dia. x 1-5/16" long, "ON" position is at extreme clockwise position	Switch, Silencer	-24568			47 Type 1561	888158-1	S-401	1	1	1	1	4
222A	S-501	Switch: push, normally closed, 0.748" dia. x 1.220" long, two solder lug terminals rating: 3 amps., 110 V a.c.	Switch, Frequency Test				699	895072-1	S-501	1	1	1	1	4
223	S-502	Switch assembly: crystal consisting of three plate assemblies, gear assembly, gear, two switch drive shafts, two switch drive gears, idler gear, socket assembly, two wafer assemblies, four plate spacers	Switch, Crystal Selector				1	722600-501	S-502	1	1	1	1	4
223A	S-502A, B	Wafer assembly: ceramic, crystal switch, 1-15/16" long x 1-5/8" wide x 0.420" high, rotor blades coin silver and contacts spring silver	Switch, Crystal Selector Wafer				695	889279-501	S-502A, B	2	1	1	1	4
224	S-601	Switch assembly: homing selector consisting of two plate assemblies, two idler gears, switch wafer shaft, and switch drive gear	Switch, Homing Selector				1	717815-501	S-601	1	1	1	1	4
225	S-601A	Switch: rotor, 12 contacts, rotor blades coin silver, contacts spring silver, body laminated phenolic 1-27/32" dia., rotor shaft hole 0.250" dia. x 0.187" flat	Switch, Homing				451	430759-1	S-601A	1	1	1	1	4
226	S-601B	Switch: rotary, selector, 12 positions, laminated phenolic, rotor blades coin silver, contacts spring silver, 1-1/2" dia. x 1.562" between mounting holes x 1-9/32" wide, shaft 0.249" dia. x 17/32" long	Switch, Selector				451	433904-1	S-601B	1	1	1	1	4
227	S-602	Not Used	Switch, Limit				1	719690-501	S-603	1	1	1	1	4
	S-603	Switch assembly: limiter, consisting of two plate assemblies, shaft assembly, gear assembly, switch arm assembly, disc assembly, arm assembly, clutch disc, clutch drive pinion, switch arm clamp gear, collar, three springs, switch, clutch gear, and three studs	Switch, Limit											
227A	S-603A	Switch limit, single button, three 0.093" dia. mounting holes, 19/32" high x 17/32" wide x 1-1/4" long	Switch, Limit				246 CR1070C103-A3	892799-1	S-603A	1	1	1	1	4

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COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS				
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWG, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DNG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP. TENDER	BOX NO.	QUAN.
RECEIVER TRANSMITTER (continued)														
228	V-101	Tube: electron, push-pull, r-f beam power amplifier, 7-pin base	Tube, Intermediate P-A	JAN -82aB			516		V-101	1	1	2	1	3
229	V-102	Tube: electron, h-h-f transmitting triode, special type mounting	Tube, Tripler	JAN -2C39			246		V-102, 103	2	1	4	1	6
230	V-103	Same as V-102	Tube, P-A	JAN -2C39					V-103	1				
231	V-201	Tube: electron, midget remote cut-off pentode, miniature button 7-pin base	Tube, Receiver R-F	JAN -0003			516		V-201	1	1	2	1	3
232	V-202	Tube: electron, sharp cut-off pentode, miniature button 7-pin base	Tube, 1st Detector	JAN -6AK5			669		V-202	1	1	2	1	3
233	V-203	Tube: electron, h-f twin triode, miniature button 7-pin base	Tube, Receiver Tripler	JAN -6J6			516		V-203	1	1	2	1	3
234	V-301	Tube: electron, r-f pentode, semi-remote cut-off, small wafer octal 8-pin phenolic base	Tube, 1st I-F	JAN -12SG7			516		V-301, 302, 303, 304	4	1	8	1	12
	V-302	Same as V-301	Tube, 2nd I-F	JAN -12SG7					V-302	1				
	V-303	Same as V-301	Tube, 3rd I-F	JAN -12SG7					V-303	1				
	V-304	Same as V-301	Tube, 4th I-F	JAN -12SG7					V-304	1				
235	V-305	Tube: electron, twin diode, small wafer octal 7-pin phenolic base	Tube, 2nd Detector A.V.C.	JAN -12H6			516		V-305, 401	2	1	4	1	6
	V-401	Same as V-305	Tube, Voltmeter Rectifier Noise Peak Limiter	JAN -12H6					V-401	1				
236	V-402	Tube: electron, twin triode high mu amplifier intermediate shell octal 8-pin phenolic base	Tube, 1st A-F Squelch	JAN -12SL7-GT			516		V-402, 701	2	1	4	1	6
237	V-403	Tube: electron, beam power amplifier, small wafer octal 7-pin phenolic base	Tube, Receiver A-F Output	JAN -12A6			516		V-403	1	1	2	1	3
238	V-501	Tube: electron, video power amplifier pentode, small wafer octal 8-pin base	Tube, Converter	JAN -6AG7Y			516		V-501, 504	2	1	4	1	6
	V-502	Tube: electron, h-f power triode, miniature button 7-pin base	Tube, 2nd Tripler	JAN -6C4			516		V-502, 503, 505	3	1	6	1	9
	V-503	Same as V-502	Tube, 1st Tripler	JAN -6C4					V-503	1				
	V-504	Same as V-501	Tube, Oscillator Doubler	JAN -6AG7Y					V-504	1				
	V-505	Same as V-502	Tube, Oscillator	JAN -6C4					V-505	1				
	W-101	through W-103 Not Used												

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MAR RADIO EQUIPMENT

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PARTS										SPARE PARTS					
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	TENDER BOX NO.	QUAN.	STOCK BOX NO.
RECEIVER TRANSMITTER (Continued)															
239	W-104	Cable assembly: consisting of 3-conductor cable 24" long, each conductor AWG #16, black, green, and red copper shielding braid, vinylite cover, two AN-3100/20/6501W connectors, two waterproof clamp assemblies, and two soldering ferrules	Cable, Modulator to Transmitter	-62222			1	722628-501	W-104	1	2	1	1	1	2
240	W-201	Cable assembly, coaxial, 24" long, and Type UG-85/U connector on each end, black synthetic rubber composition grommet	Cable Assembly, Receiver Antenna	AN-RG-58/U			1	439521-502	W-201	1	1	1	1	1	3
241	W-201A	Cable: R-F coaxial, flexible, impedance 53.5 ±2.5 ohms, single #AWG #20 solid copper axial conductor, solid Type "A" dielectric 0.116" dia. single tinned copper wire braid 0.150" dia., with black synthetic resin jacket 0.195" dia. x 48" long	Cable, R-F Coaxial Transmission Line	AN-RG-58/U JAN C/17			30, 935	99258-1	W-201A	1	2	1	1	1	2
242	X-101	Socket tube: mycalex, contacts beryllium copper, heavy silver-plated, five double contacts 2-3/4" square, excluding the five terminals 2-3/16" thick, ten holes 0.089" dia., and four holes 0.173" dia., arrow indicates key pin	Socket, V-101 1st I-P-A	-49385			277	871665-1	X-101	1	2	1	3	1	2
243	X-201	Socket: tube, miniature 7-pin type, ceramic, with metallic center shield, seven contacts 1-1/8" x 0.900" x 1-9/32"	Socket, Receiver R-F	-49956 JAN S-28			755 Type 102M	883996-1	X-201, 202, 203 502, 503, 505	6	2	3	3	3	6
	X-202	Same as X-201	Socket, Receiver Detector	-49956					X-202	1					
	X-203	Same as X-201	Socket, Receiver Tripler	-49956					X-203	1					
244	X-301	Socket: steatite ceramic, one #4 retaining ring, eight contacts phosphor bronze, silver plated, 1-1/4" dia. x 51/64" long	Socket, 1st I-P	-49373 RE 13A 317 Grade G			30 SS-8M	856956-6	X-301, 302, 303 304, 305, 401 402, 403, 501 504	10	2	7	3	7	13
	X-302	Same as X-301	Socket, 2nd I-P	-49373					X-302	1					
	X-303	Same as X-301	Socket, 3rd I-P	-49373					X-303	1					
	X-304	Same as X-301	Socket, 4th I-P	-49373					X-304	1					
	X-305	Same as X-301	Socket, Detector A.V.C.	-49373					X-305	1					
	X-401	Same as X-301	Socket, Meter Rectifier Noise Suppressor	-49373					X-401	1					
	X-402	Same as X-301	Socket, Squelch 1st A-F	-49373					X-402	1					

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PARTS																
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	ANS. JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS					
RECEIVER TRANSMITTER (Continued)																
	X-403	Same as X-301	Socket, A-F Output	-49373					X-403	1						
	X-501	Same as X-301	Socket, Converter	-49373					X-501	1						
	X-502	Same as X-201	Socket, 2nd Tripler	-49956					X-502	1						
	X-503	Same as X-201	Socket, 1st Tripler	-49956					X-503	1						
	X-504	Same as X-301	Socket, Oscillator Doubler	-49373					X-504	1						
	X-505	Same as X-201	Socket, 10 MC Oscillator	-49956					X-505	1						
245	X-506	Socket: female contact, type MFE, phenolic body, 24 contacts, beryllium copper, silver plated, numbered 1 to 10 lettered A,B,W,X,Y,Z, five mounting holes with brass inserts 0.144" dia. holes 3-9/16" long x 2-1/2" wide x 0.406" thick excluding contacts	Socket, Crvstal Oven	-49623 17-P4-MFE			2180	433174-1	X-506	1	2	1	3	1	2	1
246	X-507	Socket: ceramic, two female contacts, beryllium copper to fit 0.125" dia. pins 1-3/8" long x 15/32" wide x 3/4" thick overall, two mounting holes 0.140" dia. on 1.093" centers	Socket, Multiplier	-49584 RB 13A 317 Grade G			1146	887279-1	X-507	1	2	1	3	1	2	1
247	Y-511	Crystal unit: third harmonic crystal for 10,066.7 kc, max. deviation 0.012% for temp. range 0 to 85°C., hermetically sealed in holder 1-1/4" high x 1-5/32" wide x 7/16" thick, two terminal pins 5/8" long x 1/8" dia.	Mixer, Crvstal & Holder	-40177			1 RC-1A	888544-1	Y-511	1	1	1	2	1	3	2
248	Z-100A	Intermediate r-f amplifier assembly: consisting of one tube housing, two condenser assemblies, two variable capacitors, one tube socket, one sling, two connector assemblies, one shoulder screw, one stud three taper pins, two ball bearings and hardware, three capacitors, four gear assemblies	R-F Amplifier, Intermediate				1	618542-501	Z-100A	1			2	1	3	2
249	Z-100B	Tripler assembly: consisting of one box, three plate, one tube, one connector, two disc, one stator plate, one loop, one bracket and one lock assemblies, with miscellaneous insulators, capacitors and hardware	Tripler Assembly				1	888189-501	Z-100B	1			3	1	5	2

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PARTS										RECEIVER TRANSMITTER (Continued)								
	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP.	TENDER	STOCK	BOX NO.	QUAN.	QUAN.	BOX NO.
250	Z-100C	Amplifier power assembly: consisting of one box, one tube, two connector, one disc, two plate, one loop, one spring, one stator plate, one rotor plate, and one lock assemblies, with miscellaneous insulators, capacitors and hardware	Assembly, P-A				1	888188-501	Z-100C	1								
250a	Z-101	Suppressor assembly: 680 ohms, 1 watt resistor, 9/16" long with 15 turns AWG #28 DOC wire centered on resistor, two axial wire leads 1-1/2" long	Suppressor, V-101 Plate				722	895045-501	Z-101	1	2	1	1	3	1			
	Z-102, 103	Not Used																
251	Z-104	Connector assembly: jack filter for receiver power, consisting of connector housing and three High K capacitors 55 mmf $\pm 10\%$, 350 v d.c. working	Connector, Modulation Input				1	439145-501	Z-104	1	2	1	3	2	2			
252	Z-105	Connector assembly: jack filter for receiver power, consisting of connector housing and eight High K type ceramic capacitors, 1800 mmf $\pm 20\%$, 350 v d.c. working	Connector, Receiver Transmitter Power Input				I	439147-501	Z-105, 803, 805	3	2	1	3	2	2			
253	Z-200	R-F assembly: consisting of one condenser assembly, one receptacle, 33 capacitors, three sockets, two terminal assemblies, six shields, one coil assembly, plus miscellaneous mounting hardware, approx overall dimensions 10-1/2" long x 4-1/2" high x 2-1/16" wide	Assembly, R-F Receiver				1	618525-501	Z-200	1	2	1	2	1	3			
254	Z-301	Transformer: i-f assembly, consisting of one coil 5-3/4 turns AWG #18 copper wire, 16 turns per inch, one coil 4-3/4 turns 0.040" dia. copper wire, 16 turns per inch, adjustable iron core assembly each end, and two capacitors, C-301 and C-302, enclosed in shield can 3.389" long x 1.375" square	Transformer, 1st I-F				1	618106-501	Z-301	1	2	1	1	2	1			
255	Z-302	Transformer: i-f assembly, consisting of two coils each 4-3/4 turns AWG #18 copper wire, adjustable iron core assembly, each end enclosed in shield can 3.389" long x 1.375" square	Transformer, 2nd I-F				1	618106-502	Z-302	1	2	1	1	2	1			

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PARTS										SPARE PARTS						
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AMS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.
RECEIVER TRANSMITTER (Continued)																
256	Z-303	Transformer: i-f assembly consisting of two coils each 4-3/4 turns AWG #18 copper wire 16 turns per inch, two capacitors, C-305 and C-306, adjustable iron core assembly, each end enclosed in shield can 3.389" long x 1.375" square	Transformer, 3rd I-F				1	618106-503	Z-303	1	2	1	1	2	1	3
257	Z-304	Transformer: i-f assembly consisting of two coils each 4-3/4 turns AWG #18 copper wire 16 turns per inch, two capacitors, C-307 and C-308, adjustable iron core assembly, each end enclosed in shield can 3.389" long x 1.375" square	Transformer, 4th I-F				1	618106-504	Z-304	1	2	1	1	2	1	3
258	Z-305	Transformer: i-f assembly consisting of one coil 5-1/4 turns AWG #18 copper wire 16 turns per inch, one coil 4-1/4 turns AWG #18 copper wire 16 turns per inch, two capacitors, C-309 and C-310, adjustable iron core assembly, each end enclosed in shield can 3.389" long x 1.375" square	Transformer, Diode I-F				1	618106-505	Z-305	1	2	1	1	2	1	3
259	Z-401	Transformer: output filter assembly consisting of three coils each with 5100 mmf capacitor connected in parallel; Coil 1, 3400 turns AWG #39 h-f wire 428 ohms d-c resistance; Coil 2, windings 1/2/3, 560 turns AWG #35 E wire, 36 ohms d-c resistance, 258 turns AWG #37 E wire, 29 ohms d-c resistance, 2180 turns AWG #39 E wire, 448 ohms d-c resistance; Coil 3, 5500 turns AWG #41 h-f wire, 1102 ohms d-c resistance; hi-pot coils to cores 1500 v, sealed in can 3-29/32" high x 2-11/16" long x 1-3/4" wide, including mounting flange with two holes 0.199" dia. on 2-5/16" centers, terminals extend 31/64"	Filter, Receiver Output	-301848 RE 13A 553B			1	901816-501	Z-401	1	1	1	1	2	3	3
260	Z-402	Filter: phone jack assembly consisting of brass box 1-7/8" long x 1.210" wide x 1.460" high, three covers, jack, two r-f choke coils, three capacitors 1800 mmf each	Receiver, Output Jack and Filter Assembly	-53277			1	72615-501	Z-402	1	1	1	1	1	3	2

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE B-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL . MAR RADIO EQUIPMENT															
PARTS										SPARE PARTS					
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AMS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP.	TENDER	STOCK	QUAN.
RECEIVER TRANSMITTER (Continued)															
261	Z-500	Multiplier assembly: consisting of variable condenser, three transformer assemblies, one cover assembly, six sockets, five terminal board assemblies, one link assembly, two coil assemblies, 22 capacitors, chassis assembly, inductors, and miscellaneous hardware	Multiplier				1	618916-503	Z-500	1			2	1	4
262	Z-501	Transformer assembly: consisting of one coil six turns AWG #11 copper wire, nine turns per inch, one capacitor C-516, adjustable magnetic core assembly, bottom end enclosed in shield can 2.999" high x 1.375" square	Coil, V-503 Plate				1	618106-508	Z-501	1			2	1	3
263	Z-502	Transformer assembly: consisting of one coil 28-1/2 turns AWG #18 copper wire, 16 turns per inch, including one capacitor C-522, adjustable iron core assembly, bottom end enclosed in shield can 2.999" high x 1.375" square	Coil, V-505 Plate				1	618106-506	Z-502	1			2	1	3

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS			MODULATOR DYNAMOTOR										SPARE PARTS				
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AS'S JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.	STOCK
	A-701	Not Used															
664	A-702	Mount: vibration, square, 3 lbs. load rating at 1/16" deflection, 1-1/4" dia. square x 13/32" thick, four 0.141" mounting holes on 1" centers, 0.166" dia. hole through center	Lord Mounting, Modulator Dynamotor						A-702	1		2	1	3	4	5	4
665	C-701	Capacitor: fixed, molded mica, 5600 mmf x 11/32" thick, with two axial wire leads 1-1/8" long	Capacitor, V-701 Grid Coupling	JAN CM35.562K JAN C-5			371 Cat.#100PN3	429667-3	C-701, 704, 707, 709, 721	5		2	1	3	3	5	5
666	C-702	Capacitor: fixed, molded mica, 4600 mmf x 11/32" thick, with two axial wire leads 1-1/8" long	Capacitor V-701 Grid Coupling	JAN CM35.472K JAN C-5			203	722030-555	C-702, 705, 708, 710, 730	5		2	1	3	3	5	5
667	C-703	Capacitor: fixed, paper, 1 mf, 500 v d.c. working, metal case hermetically sealed pyranol, oil filled, 2-9/16" wide x 13/16" deep x 2-9/16" long, with mounting plate notched 1-15/16" between centers, two terminal soldering lugs	Capacitor, V-701 Plate By-pass	-481852			246 Cat.#23F207-G2	889896-2	C-703, 711, 712, 801, 802, 803, 811	7		1	4	1	11	4	18
	C-704	Same as C-701	Capacitor, V-702 Grid Coupling	JAN CM35.562K					C-704	1							
	C-705	Same as C-702	Capacitor, V-702 Grid Coupling	JAN CM35.472K					C-705	1							
	C-706	Same as C-329	Capacitor, MCW Oscillator Tuning						C-706	1							
	C-707	Same as C-701	Capacitor, V-701 Phase Inverter Grid Coupling	JAN CM35.562K					C-707	1							
	C-708	Same as C-702	Capacitor, V-701 Phase Inverter Grid Coupling	JAN CM35.472K					C-708	1							
	C-709	Same as C-701	Capacitor, V-703 Grid Coupling	JAN CM35.562K					C-709	1							
	C-710	Same as C-702	Capacitor, V-703 Grid Coupling	JAN CM35.472K					C-710	1							
	C-711	Same as C-703	Capacitor, V-702 Screen By-pass	-481852					C-711	1							
	C-712	Same as C-703	Capacitor, V-702 Screen By-pass	-481852					C-712	1							
	C-713, 714	Not Used															

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT															
PARTS												SPARE PARTS			
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	QUAN.	STOCK
MODULATOR DYNAMOTOR (Continued)															
268	C-715	Capacitor: dry, electrolytic, 50 mf +65% -10%, 25 v d.c. working, 1-17/32" long x 11/16" dia., two axial wire leads 3" long	Capacitor, Bias By-pass	-482804 RE 13A 549 RE 48A 404			382	95638-1	C-715, 716, 717, 718, 733, 901	6	2	7	3	15	5 15
	C-716	Same as C-715	Capacitor, Microphone Cou- pling	-482804					C-716	1					
	C-717	Same as C-715	Capacitor, Relay By-pass	-482804					C-717	1					
	C-718	Same as C-717	Capacitor, Relay By-pass	-482804					C-718	1					
	C-719, 720	Not Used													
	C-721	Same as C-701	Capacitor, Line Coupling	JAN CM35.562K					C-721	1					
	C-722 to C-725	Not Used													
	C-726	Same as C-329	Capacitor, MCW Oscillator Tuning						C-726	1					
	C-727 to C-729	Not Used													
	C-730	Same as C-702	Capacitor, V-730 Line Coupling	JAN CM35.472K					C-730	1					
269	C-731	Capacitor: fixed, molded mica, 1000 mfd 15%, 500 v d.c. working, 53/64" square x 9/32" thick, with two axial wire leads 1-1/8" long	Capacitor, V-702 Grid Shunt	JAN CM30B102J JAN C-5			203	722018-509	C-731, 732	2	2	1	3	1	5 2
	C-732	Same as C-731	Capacitor, V-703 Grid Shunt	JAN CM30B102J					C-732	1					
	C-733	Same as C-715	Capacitor, V-701 Cathode By-pass	-482804					C-733	1					
270	E-701	Terminal board assembly: consisting of terminal board 1/8" thick, glass base, melamine, laminated, 1-5/16" wide x 2-5/16" long, two screw type binding posts, one terminal, miscellaneous hardware and terminal board, marked line 1, 2, and ground	Terminal Board, Dynamotor Input	17-P-5			1	887239-502	E-701	1				1	1
	E-702	Same as E-601	Knob, R-720						E-702	1					

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS				
ITEM	SYMBOL DESIGN.	NAME OF PART AND DESCRIPTION	FUNCTION	AWJ JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP. TENDER	BOX NO.	QUAN.
MODULATOR DYNAMOTOR (Continued)														
271	H-701	Gasket: molded neoprene, durometer 35 $\frac{1}{8}$ ", rectangular, 11.457" long x 7.707" wide outside x 10.801" long x 7.051" wide inside, $\frac{21}{64}$ " thick	Gasket, Modulator Panel				1	433538-2	H-701	1	1	1	2	1
272	H-702	Gasket: molded neoprene, durometer 35 $\frac{1}{8}$ ", rectangular 11.468" long x 7.718" wide outside x 10.500" long x 6.750" wide inside, $\frac{3}{8}$ " thick	Gasket, Modulator Cover				1	433538-4	H-702	1	1	1	2	1
273	H-703	Gasket: molded neoprene, durometer 35 $\frac{1}{8}$ ", rectangular, 7.710" long x 6.768" wide outside x 7.054" long x 6.132" wide inside, $\frac{3}{8}$ " thick	Gasket, Modulator Accessory Compartment Cover				1	433538-6	H-703	1	1	1	2	3
274	H-704	Boot: neoprene, black, durometer approx. 40, 1-7/16" wide x 3" long x 1-1/2" high, 0.173" dia. mounting hole each corner spaced 1" x 2-1/2" apart	Boot, Switch S-702				753	433567-1	H-704, 705, 801	3	1	3	2	6
	H-705	Same as H-704	Boot, Switch S-703						H-705	1				
	H-706	Not Used												
	H-707	Same as H-109	Gasket, Neoprene, Water Sealing Z-703						H-707	1				
	H-708	Same as H-109	Gasket, Neoprene, Water Sealing Z-703						H-708	1				
275	H-709	Clamp tube assembly: consisting of stainless steel clamp 1-1/4" I.D., curved brace 63/64" high x 21/32" wide, Plate 1.500" O.D. x 1.172" I.D. with 0.0935" x 0.187" key, aluminum cup 1-7/8" O.D. x 1.375" I.D. x 0.344" high, 2.187" between centers, two mounting holes 0.156" dia.	Clamp, Socket X-701				1	888502-501	H-709	1	1	1	2	1
276	H-710	Grommet: neoprene, durometer 35, 1-21/32" O.D. x 1-11/32" I.D. x 11/32" thick	Grommet, X-701 Socket Mounting				492	886896-1	H-710	1				5
	H-711	Same as H-429	Washer, Water Sealing, Outer for Z-701						H-711	1				
	H-712	Same as H-429	Washer, Water Sealing, Outer for Z-702						H-712	1				
	H-713	Same as H-429	Washer, Water Sealing, Outer for Z-703						H-713	1				

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT															
PARTS										SPARE PARTS					
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	EQUIP.	TENDER	STOCK NO.
MODULATOR DYNAMOTOR (Continued)															
277	H-714	Washer: neoprene, durometer hardness 50 ±5%, cross section 1/16" dia., 1-31/64" O.D. x 1-23/64" I.D.	Washer, Water Sealing				1	887824-9	H-714	1	1	1	1	1	4
	H-715	Same as H-714	Washer, Water Sealing						H-715	1					3
	H-716	Same as H-715	Washer, Water Sealing						H-716	1					3
	H-717	Same as H-716	Washer, Water Sealing						H-717	1					3
278	K-701	Relay: armature, coil 750 ohms, 16,200 turns AWG #34 EC wire, contacts four form "C" pile-ups, 4 P.S.T. normally open, double break, case hermetically sealed 4-3/4" long x 2-1/4" wide x 3" high, four mounting holes #8-32 tap 5/16" deep, 14 terminals extending 7/16"	Relay, Transmitter Receiver	-29479			713 FS218 Type C	722609-1	K-701	1	1	1	1	2	3
279	K-702	Relay: voltage regulator hermetically sealed and nitrogen filled coil, rated 12 v, 250 ohms, two form "C" contacts closed in one direction when coil is not energized, to open before making contact on other side when coil is energized	Relay, Voltage Regulator				713 Dwg. FS56	429680-2	K-702	1	1	1	2	3	5
280	L-701	Coil: A-F, single winding, 1310 turns AWG #36 wire, 50 ohms d-c resistance, impedance 150 ohms min. at 3 v, 1000 cycles and 0.015 amp. d.c., insulation test 500 v, case hermetically sealed 2-13/32" long x 7/8" dia. mounting bracket, with 0.156" hole, two ter- minals extending 7/16"	Reactor, Relay Filter	RE 13A 553B			1	901801-501	L-701	1	2	1	3	2	5
281	R-701	Resistor: variable, composition, 470,000 ohms ±10%, 2 watts, linear taper 1-1/2" dia. x 19/32" thick, type 2 screwdriver shaft 0.250" dia. x 5/8" long	Volume Control, V-701 Input	-633031			711 Type C	441149-4	R-701, 725	2	2	1	3	6	10
282	R-702	Resistor: fixed, composition, 1000 ohms ±5%, 1/2 watt, insulated, small, 0.468" max. length x 0.249" max. dia., two axial wire leads 1.5" long	Resistor, V-701 Cathode	JAN RC20BF- 102J JAN R-11			722	722318-159	R-702	1	2	1	3	3	5
	R-703	Not Used													

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS			MODULATOR DYNAMOTOR (Continued)										SPARE PARTS				
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	EQUIP.	TENDER	STOCK NO.		
283	R-704	Resistor: fixed, composition, 12,000 ohms $\pm 10\%$, 1 watt, insulated, small, 0.718" max. length x 0.280" max. dia., with two axial wire leads 1.5" long	Resistor, V-701 Plate Drooping	JAN RC30BF-123K JAN R-11			722	722333-75	R-704	1	2	1	3	3	5		
	R-705	Same as R-201	Resistor, V-701 Phase Inverter Grid	JAN RC20BF-224K					R-705	1							
284	R-706	Resistor: fixed, composition, 0.10 megohms $\pm 5\%$, 1 watt, insulated, large, 1.28" max. length x 0.310" max. dia., with two axial wire leads 1.5" long	Resistor, V-701 MCW Plate	JAN RC31BE-104J JAN R-11			722	722337-207	R-706, 709	2	2	1	3	6	10		
285	R-707	Resistor: fixed, composition, 1.0 megohms $\pm 5\%$, 1 watt, insulated, small, 0.750" max. length x 0.280" max. dia., two axial wire leads 1.5" long	Resistor, V-701 MCW Plate	JAN RC30BF-105J JAN R-11			722	722333-231	R-707	1	2	1	2	3	5		
	R-708	Not Used															
	R-709	Same as R-706	Resistor, V-701 Phase Inverter Plate	JAN RC31BE-104J					R-709	1							
	R-710	Same as R-508	Resistor, V-702 Grid	JAN RC20BF-104J					R-710	1							
	R-711	Same as R-208	Resistor, Modulator Balancing	JAN RC20BF-334K					R-711	1							
	R-712	Same as R-508	Resistor, V-703 Grid	JAN RC20BF-104J					R-712	1							
286	R-713	Resistor: fixed, composition, 50 ohms $\pm 5\%$, 5 watts, vitreous enamel covered, fired on ceramic coil and grooved 2" long x 5/8" dia., with two radial leads 1-3/4" long	Resistor, Modulator Cathode	-633034-5			738 Type 5X	861832-9	R-713	1	2	1	3	3	5		
	R-714	Same as R-209	Resistor, V-701 Plate Filter	JAN RC30BF-103K					R-714	1							
287	R-715	Resistor: fixed, wire wound, 100 ohms $\pm 5\%$, 30 watts, vitreous enamel covered 2-1/2" long overall x 1-3/16" max. wide x 5/8" thick, including two radial terminals and two axial mounting lugs two 0.196" dia. mounting holes on 2" centers	Resistor, Voltage Divider	JAN R-26 13-A-372			281	875852-13	R-715, 805	2	2	1	1	6	10		
288	R-716	Resistor: fixed, wire wound, 10,000 ohms $\pm 5\%$, 30 watts, vitreous enamel covered 2-1/2" long overall x 1-3/16" max. wide x 5/8" thick, including two radial terminals and two axial mounting lugs, two 0.196" dia. mounting holes on 2" centers	Resistor, Voltage Divider				281 BR-1-1/4 752 1-1/4 Strip Bulletin 23	875852-6	R-716	1	2	2	3	3	5		

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																	
PARTS										SPARE PARTS							
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.	
MODULATOR DYNAMOTOR (Continued)																	
289	R-717	Resistor: fixed, wire wound, 2500 ohms 1 5/8", 30 watts, vitreous enamel covered 2-1/2" long overall x 1-3/16" max. width x 5/8" thick, including two radial terminals and two axial mount- ing lugs, two 0.196" dia. mounting holes on 2" centers	Resistor, Voltage Divider				281 BR-1-1/4 752 1-1/4 Strip Bulletin 23	875852-9	R-717	1	2	1	1	1	3	2	5
290	R-718	Not Used															
290	R-719	Resistor: fixed, wire wound, 8800 ohms 1 5/8", 30 watts, vitreous enamel covered 2-1/2" long overall x 1-3/16" max. width x 5/8" thick, including two radial terminals and two axial mounting lugs, two 0.196" mounting holes on 2" centers	Resistor, Modulator Output Load				281 BR-1-1/4 752 1-1/4 Strip Bulletin 23	875852-3	R-719	1	2	2	3	3	5	5	5
291	R-720	Resistor: variable, 0.50 ohms, 25 watts, 1-5/8" dia. x 1-3/8" thick with slotted shaft 0.250" dia. x 1-1/8" long	Rheostat, Heater Control	-633236			281 Type A-25 752 Type K-41375 321, PR-25	888518-2	R-720	1	2	1	3	3	5	5	5
292	R-721	Resistor: wire wound, 390 ohms 10%, 2 watts, insulated, 5/16" dia. x 1-3/4" long with two axial wire leads 1-1/2" long	Resistor, Microphone				321 Type BW	867972-357	R-721	1	2	1	3	3	5	5	5
293	R-722	Resistor: variable, 500 ohms, 25 watts, 1-5/8" dia. x 1-3/8" thick, with slotted shaft 0.250" dia. x 3/4" long	Rheostat, Heater Balancing	-633237			281 Type M 752 Type K-41376 321 Type PR-25	888518-1	R-722	1	2	1	3	3	5	5	5
294	R-723	Not Used															
294	R-724	Resistor: fixed, wire wound, 300 ohms 1 5/8", 30 watts, vitreous enamel covered 2-1/2" long overall, 1-3/16" max. width, 5/8" thick, including two radial terminals and two axial mounting lugs two 0.196" dia. mounting holes on 2" centers	Resistor, Bias Adjusting				281 BR-1-1/4 752 1-1/4 Strip Bulletin 23	875852-11	R-724	1	2	2	3	3	5	5	5
295	R-725	Same as R-701	MCW Volume Control	-633031													
295	R-726	Resistor: fixed, composition, 16,400 ohms 1%, 5 watts, 2" long x 5/8" dia., two radial wire leads 1-3/4" long	Resistor, Voltage Regulator				738 SX	891832-18	R-726	1	1	1	2	3	2	5	5

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																
PARTS										SPARE PARTS						
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWG./AN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	EQUIP. TENDER	STOCK	ON ORDER	
MODULATOR DYNAMOTOR (Continued)																
296	S-701	Key: telegraph, 5' long x 4" wide x 2-1/32" thick, complete with 65" cord	Key, telegraph	-26026			1383 Model 288	439146-2	S-701	1	2	1	2	1	4	1
297	S-702	Switch: lever, 2 positions, both locking, extra heavy duty contacts, silver, 3/16" dia.; lower position #1: two banks, contacts left one single pole make and one S.P.D.T. rated at 10 amps, 110 v a.c.; right one S.P.D.T. rated at 10 amps, 110 v a.c.; upper position #2: locking action only, no contacts; 5-3/32" long x 1-7/16" high x 1-1/8" wide, four tapped holes #4-40 threads	Switch, MCW Phone	-24543			753 Series 4202	719699-3	S-702	1	2	1	1	1	1	1
298	S-703	Switch: lever, 2 positions, both locking, contacts rated 10 amperes, 110 v a.c.; lower position: left S.P.D.T., right none; upper position: left one single pole make, right one single pole make, 5-3/32" long x 1-7/16" wide x 1-1/8" high overall; four holes tapped #4-40 threads on 1.125" mounting centers	Switch, IC-Radio	-24544			753 Series 4202	719699-2	S-703	1	2	1	1	1	1	1
299	S-704	Link: brass, 1-1/16" long x 3/8" wide x 0.040" thick, oval shaped, cutout 0.2187" long x 0.173" wide on 3/16" center, slotted end 5/16" long x 0.173" wide	Link, Filament Voltage Balancing				1	888569-1	S-704	1			2	1	1	1
300	T-701	Transformer: oscillator, primary 1050 turns AWG #38 E wire, 68.5 ohms d-c resistance; secondary terminals 3 and 4, 2100 turns AWG #38 E wire, d-c resistance 217 ohms, inductance 1.31 henry at 1 v, 1000 cycles, and 0 amp. d.c., polarity additive, insulation test 1000 v, hermetically sealed in can 2-5/32" high x 2-5/16" long x 1-1/2" wide, including mounting flange, two mounting holes 0.199" dia., four terminals extending 7/16"	Transformer, MCW Oscillator	-301845 RE 13A 553B			1	901788-501	T-701	1	2	1	1	2	1	3

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																		
PARTS										SPARE PARTS								
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AMS-JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.
MODULATOR DYNAMOTOR (Continued)																		
301	T-702	Transformer: modulation; primary: terminals 1 and 3, 1956 turns AWG #32 E wire center tapped, terminal 2, 136 ohms d-c resistance; secondary #1: terminals 4 and 5, 2410-1/2 turns AWG #37 E wire, 615 ohms d-c resistance; secondary #2: terminals 6 and 7, 80 turns AWG #29 E wire, 3.3 ohms d-c resistance; primary impedance 2800 ohms min. at 30 V, 60 cycles, and 0.06 amp. d.c. in total winding; inductance, terminals 6 and 7 with 1,3,4 and 5 shorted, 0.003 henry at 3 V, 1000 cycles; insulation test 1500 v all windings, polarity additive, hermetic-ally sealed in can 3-1/4" high x 2-13/16" square; four mounting holes 0.180" dia. on 2-7/16" centers, terminals extend 5/8"	Transformer, Modulation	-301849 RE 13A 553B			1	901821-501	T-702	1		2	1	2	2	4	3	
302	T-703	Transformer: microphone; primary: terminals 1 and 2, 230 turns AWG #33 E wire, 18 ohms d-c resistance; secondary #1 and 2: terminals 3 and 4, two windings connected, series opposing; each 4085 turns AWG #42 E wire, 2220 ohms d-c resistance; secondary #3: terminals 5 and 6, 470 turns AWG #40 E wire, 170 ohms d-c resistance; primary impedance 95 ohms f108 at 3 V, 60 cycles and 0.05 amp. d.c.; insulation test 500 v all windings; additive polarity, hermetically sealed in case 2-3/4" high x 2-1/4" square, four mounting holes 0.180" dia. on 1-7/8" centers, terminals extend 5/8"	Transformer, Microphone and Line	-301844 RE 13A 553B			1	901787-501	T-703	1		2	1	1	2	1	3	
303	V-701	Same as V-402.	Speech Amplifier, Phase Inverter	JAN 12SL7-GT					V-701	1								
	V-702	Tube: electron, beam power amplifier, medium shell, octal 7-pin phenolic base	Tube, Modulator	JAN 6L6GA			623	6367100	V-702,703	2		1	4	1	6			
	V-703	Same as V-702	Tube, Modulator	JAN 6L6GA					V-703	1								
304	W-702	Cord: headset extension, with jack and plug approximately 65-1/8" long, Signal Corps Type PL-55 for plug and JK-26 for jack	Cord, for Headset Extension	-49534			669	888765-1	W-702	1		2	1	3	2	2	4	

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS			SPARE PARTS									
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	ANS. JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP. TENDER STOCK
MODULATOR DYNAMOTOR (Continued)												
305	W-703	Cord: microphone extension, 60" long, complete with plug, jack and press-to-talk switch, Signal Corps Type PL-68 plug and JK-48 jack	Cord, Lip, Microphone Extension	-49561			669	433990-1	W-703	1	2 1 3 2 4	2 4
306	Z-701	Filter assembly: consisting of two r-f chokes L-703 and L-705, four capacitors C-722, 723, 724 and 725 and one jack, enclosed in 0.020" thick brass case 1-29/64" long x 1.210" wide x 2.085" high inside dimensions; two covers and two angles	Microphone Jack and Filter Assembly				1	722632-502	Z-701	1	1 1 1 2 3 3	3 3
307	Z-702	Filter phone jack assembly: consisting of brass box 1-7/8" long x 1.210" wide x 1.460" high, 3 covers, jack, two r-f choke coils, two capacitors 55 mmf each, and one capacitor 24 mmf	Phone Jack and Filter Assembly	-53276			1	722615-502	Z-702, 703	2	2 2 2 4 4 6	4 6
308	Z-703	Same as Z-702	Key Jack and Filter Assembly						Z-703	1		
	Z-704	Filter assembly: remote line, water sealed in brass rectangular case, consisting of r-f choke coil and 55 mmf capacitor 2.468" high x 15/16" deep x 1.468" wide, less capacitor and terminal	Remote Line Filter				1	888994-502	Z-704	1	2 1 2 2 4 3	4 3
309	HS-701	Headset assembly: consisting of two head phones, plug and adjustable band plug 3-1/8" long, for use with extension cord, Navy Type CW -49534	Headset	-49507			669	433938-1	HS-701	1	2 1 3 2 2 4	4
310	MI-701	Microphone lip assembly: consists of lip microphone plug and two snap buttons 24-3/4" long overall, for use with extension cord Navy Type -49561	Lip Microphone				669 Type CW-51071	433939-1	MI-701	1	2 1 3 2 2 4	4
	C-801	Same as C-703	Capacitor, Dynamotor Filter	-481852					C-801	1		
	C-802	Same as C-703	Capacitor, Dynamotor Filter	-481852					C-802	1		
	C-803	Same as C-703	Capacitor, Dynamotor Filter	-481852					C-803	1		
311	C-804	Capacitor: fixed, molded mica, 1500 mmf 110%, 500 v d.c. working, 53/64" square x 9/32" thick, with 1-1/8" axial wire leads	Capacitor, Dynamotor	JAN CM30A-152K JAN C-5			1	722016-563	C-804, 806, 808, 813	4	2 1 3 3 5 4	4

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MAR RADIO EQUIPMENT

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PARTS										SPARE PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	TENDER BOX NO.	STOCK BOX NO.
MODULATOR DYNAMOTOR (Continued)													
312	C-805 Capacitor: fixed, molded mica, 8200 mmf ±10%, 300 v d.c. working, 53/64" square x 11/32" thick, with two axial wire leads 1-1/8" long	Capacitor, Dynamotor Filter	JAN CM 35A- 822K JAN C-5			203	72 2025-561	C-805, 810	2	2	1	3	5
	C-806 Same as C-804	Capacitor, Dynamotor	JAN CM30A- 152K			246 Cat. #23P280- 66	889896-1	C-806	1				
313	C-807 Capacitor: fixed, paper, 2 sections; each section 0.5 mf, 300 v d.c. working, metal case, pyranol, oil filled 2-9/16" long overall x 2-5/16" wide x 13/16" thick mounting plates, slotted holes 1-15/16" on centers, two terminals, soldering lugs; for replacement use Navy Type-482645-20	Filter Capacitor, D-801						C-807	1	1	1	2	4
	C-807A Same as C-807	Part of C-807						C-807A	1				
	C-807B Same as C-807							C-807B	1				
	C-808 Same as C-804	Capacitor, Dynamotor	JAN CM30A- 152K					C-808	1				
	C-809 Not Used												
	C-810 Same as C-805	Capacitor, Dynamotor Filter	JAN CM35A- 822K					C-810	1				
	C-811 Same as C-703	Capacitor, Dynamotor Filter	-481852					C-811	1				
	C-812 Same as C-109	Capacitor, Battery Plug Filter	-482814					C-812	1				
	C-813 Same as C-804	Capacitor, Dynamotor	JAN CM30A- 152K					C-813	1				
314	D-801 Dynamotor: input 13 v d.c., output 385 v d.c. at 500 ma, 8-5/16" max. length x 3-7/16" dia., four leads; positive in- put white, negative input white, black tracer; positive output white, red tracer, negative output white, blue tracer	Dynamotor	AMS C75.13 -211483			670	719697-1	D-801	1	2	1	3	2
315	E-801 Fuse board assembly: consisting of fuse board material, U.S.N. Grade OMG brown 3-1/4" long x 1-3/8" wide x 3/8" thick with three mounting holes 0.199" dia., two bronze fuse clips, two copper ter- minals stenciled F-801	Fuse, F-801				1	889858-501	E-801	1	2	1	3	1
315	F-802 Fuse, cartridge, 1 amp. 250 v, glass body, ferrule, 1/4" dia. x 1-1/4" long	Fuse, Dynamotor High Voltage	17-F-2E			768,784 3461,1040	881485-14	F-802	1	2	20	3	40
315	F-802A Clip, fuse, phosphor bronze nickel plated 5/16" long x 11/32" wide x 29/64" high, mounting hole 0.131" dia. for use with 1/4" dia. fuse	Fuse Clip For Dynamotor High Voltage Fuse				784 1011	99045-1	F-802A	1	2	2	3	2

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TABLE 8-2
COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL
MAR RADIO EQUIPMENT

PARTS										SPARE PARTS					
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	ANS. JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DNG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP. TENDER	STOCK	BOX NO.	QUAN.	QUAN.
MODULATOR DYNAMOTOR (Continued)															
H-801	Same as H-704	Boot, Switch S-801						H-801	1						
H-802	Cap assembly: consisting of one amphenol cap and 3" #10 nickel silver bead chain, cap 1-3/8" dia. x 7/16" wide, similar to amphenol cap and chain 9760-20 tapped with 1-1/4"-18 threads, including one neoprene washer 3/32" thick	Cap, Jack Z-804				701	433921-1	H-802	1					5	2
H-803	Cap assembly: consisting of one amphenol cap and 3" #10 nickel silver bead chain, cap 1-1/2" dia. x 7/16" wide, similar to amphenol cap and chain 9760-22 tapped with 1-3/8"-18 threads, including one neoprene washer 3/32" thick	Cap, Jack Z-803				701	433921-2	H-803, 804	2					1	3
H-804	Same as H-803	Cap, Jack Z-805						H-804	1						
H-805	Cap assembly: consisting of one amphenol cap and 3" #10 nickel silver bead chain, cap 1-5/8" dia. x 7/16" wide, similar to amphenol cap and chain 9760-24 tapped with 1-1/2"-18 threads, including one neoprene washer 3/32" thick	Cap, Jack Z-801				701	433921-3	H-805	1					1	1
J-801	Connector assembly, 1-3/4" square x 2-5/16" long, four 0.156" dia. mounting holes, two contacts 1-1/2"-18 threads on one end	Connector, Battery				1	893945-501	J-801	1	2	1	3	3	2	3
L-801	Not Used														
L-802	R-F choke: winding, housed internally in mold with 1-3/8" leads 0.030" dia., each end, body 3/4" long x 1/4" O.D., 29 turns AWG #24 wire, close wound	R-F Choke, Dynamotor	-47871			795 Type CF NO-170	889568-2	L-802, 803	2	2	2	1	4	1	6
L-803	Same as L-802	R-F Choke, Dynamotor	-47871												
O-801	Bearing: ball, single row, radial, double shield, steel 0.4998" O.D. x 0.18735" I.D. x 0.1944" wide, with 7/32" dia. balls	Bearing, Commutator End D-801				439 7-R-3	885655-9	L-803 O-801	1	2	1	1	2	1	1
P-801	Connector: male, contact, two round contacts 1-23/32" dia. x 2-1/4" long, tapped #1-1/2"-18 threads and 1-7/16" threads, key position one	Connector, Battery to Dynamotor Cable	AN-3106-24-9S AN-WC-591 101-W			30	433957-3	P-801, 904	2	2	1	2	1	4	2
R-801	Resistor: fixed, wire wound, 335 ohms 1/2", 55 watt, 4-3/4" long overall x 1-3/16" wide x 1-1/8" high, including two radial leads, two axial mounting terminals with two 0.196" dia. holes on 4-1/4" centers	Resistor, Power Supply Dropping	JAN R-26			281	894368-2	R-801	1	2	1	1	3	2	5

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TABLE 8-2 COMBINED PARTS AND SPARE PARTS LIST BY SYMBOL DESIGNATION FOR NAVY MODEL MAR RADIO EQUIPMENT																						
PARTS										MODULATOR DYNAMOTOR (Continued)												
ITEM	SYMBOL DESIG.	NAME OF PART DESCRIPTION	FUNCTION	AWS JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS											
											BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.	STOCK	BOX NO.	QUAN.			
324	R-802	Resistor: fixed, composition, 1200 ohms $\pm 10\%$, 1 watt, insulated, large, 1.28" max. length x 0.30" max. dia., with two axial wire leads 1.5" long	Resistor, Dynamotor Filter	JAN RC31BE-122K JAN R-11			722	722337-63	R-802	1	2	1	3	3	5							
325	R-803	Resistor: fixed, wire wound, 150 ohms $\pm 5\%$, 30 watts, vitreous enamel covered 2-1/2" long overall x 1-3/16" wide x 5/8" thick, including two radial terminals, two axial mounting lugs with 0.196" dia. mounting holes on 2" centers	Resistor, Power Supply Dropping	JAN R-26			281 Type BR-1-1/4	875852-8	R-803	1	1	1	2	3	2	5						
326	R-804	Resistor: fixed, wire wound, 400 ohms $\pm 5\%$, 30 watts, vitreous enamel covered 2-1/2" long overall x 1-3/16" wide x 5/8" thick, including two radial terminals, two axial mounting lugs with 0.196" dia. mounting holes on 2" centers	Resistor, Voltage Regulating	JAN R-26			281	875852-2	R-804	1	2	1	2	3	2	5						
	R-805	Same as R-715	Resistor, Power Supply Dropping						R-805	1												
327	S-801	Switch: lever, 3 positions, all locking contacts rated 10 amps., 110 v a.c.; lower position: left three single pole make, right two single pole make and one S.P.D.T.; center position neutral; upper position locking only, no contacts; 5-3/32" long x 1-7/16" wide x 1-1/8" high overall, four holes tapped #4-40 threads on 1.125" mounting centers	Switch, Power	-24536			753 Series 4203	716999-1	S-801	1	1	1	1	1	4	1						

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MAR RADIO EQUIPMENT

PARTS										SPARE PARTS				
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	ANS. JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	EQUIP.	TENDER	STOCK
MODULATOR DYNAMOTOR (Continued)														
328	W-801	Cable assembly: battery, consisting of cable, 2 conductors AWG #3, one white, one black, seven conductors of 19 strands each 0.0201", aluminum 2/64" vinylite V8-5901, 0.008" aluminum shielding braid, hi-pot conductor to shield 1500 V, cable 60" long, one aluminum connector, two aluminum clamping rings, one waterproof clamp assembly and two spring clips 2-5/8" long, 1" jaw spread with neoprene insulator used over clips, one red and one black	Cable, Battery to Dynamotor	-62223			1	722658-501	W-801	1	2	1	3	1
329	W-802	Cable assembly: consisting of 9-conductor cable 24" long, three of AWG #12, white, black, orange, six of AWG #20 green, red, blue, brown, slate, yellow, conner shielding braid and vinylite cover: two AN 3106-22-16S-101W connectors, each wire contacts, two clamp assemblies and two soldering ferrules	Cable, Dynamotor to Receiver Transmitter	-62224			1	722655-501	W-802	1	2	1	1	1
330	Z-801	Suppressor assembly: consisting of coil, eight turns AWG #10 tinned conner wire wound over resistor, fixed, composition 27 ohms, 1 watt, insulated, assembly 2.36" long x 1/2" O.D.	Suppressor, for Battery Input				1	888570-501	Z-801, 802	2			1	2
	Z-802	Same as Z-801	Suppressor, for Battery Input						Z-802	1				
	Z-803	Same as Z-105	Connector, Dynamotor Output						Z-803	1				
	Z-804	Not Used												
	Z-805	Same as Z-105	Connector, Power Input						Z-805	1				

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MAR RADIO EQUIPMENT

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PARTS										SPARE PARTS			
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWG, JAN. OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO. EQUIP.	BOX NO. TENDER	BOX NO. STOCK
POWER SUPPLY													
	C-901	Same as C-715	Output Coupling, R-C Unit	-482804					C-901	1			
	H-901	Same as H-103	Gasket, Power Supply Cover						H-901	1			
331	P-901 P-903	Connector: female contact, four round contacts 1-15/32" dia. x 2-1/8" long, tapped 1-1/4"-18 threads and 1-3/16"-18 threads, key position 1	Connector, 175/230 Power Supply Input Cable	AN-3106-20 4S AN-WC-591-101W			30	433957-4	P-903	1	2	1	4
	P-904	Same as P-801	Connector, 26 v Power Supply Input Cable	AN-3106-24 9S-101W					P-904	1			
332	W-901	Cable assembly: consisting of 9-conductor cable 96" long: three of AWG #12, white, black, orange; six of AWG #20, green, red, blue, brown, slate, yellow; copper shielding, braid and vinylite cover, one AN-3106-22-16S 101W; 9-contact connector each end, two clamp assemblies and two soldering ferrules	Cable, Power Supply to Modulator	-62225			1	722625-502	W-901	1	2	1	3
ANTENNA													
333	A-1001	Cap assembly: consisting of one amphenol cap and 3" #10 nickel silver bead chain cap 3/4" dia. x 1/4" wide tapped 5/8"-24 threads, including one neoprene washer 3/32" thick	Cap, Antenna				1	433921-4	A-1001	1			5
334	E-1001	Insulator assembly: consisting of one molded styramic insulator 1-3/4" dia. x 1" long with six through holes 0.173" dia. reamed to 0.266" dia. x 11/16" depth, one brass connector 2.937" long x 0.500" dia. one end, other end swaged to 3/8" wide x 1/8" thick	Insulator, Dipole				1	439155-501	E-1001	1	1	1	2
	E-1002	Same as E-301	Inner Conductor Terminal, Part of J-1001						E-1002	1			
	E-1003, 1004	Not Used											
335	E-1005	Insulator: bead, styramic, 0.848" O.D. x 0.378" I.D. x 1/4" thick, 1/32" x 45° chamfer both sides of I.D.	Insulator, Antenna Mast Bead				1	888721-1	E-1005	1	1	1	3
336	E-1006	Insulator: bead, styramic, 1.125" O.D. x 0.253" I.D. x 1/4" thick	Insulator, Antenna Mast Bead				1	888721-2	E-1006	1	1	1	3

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PARTS										SPARE PARTS						
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											BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.
ANTENNA (Continued)																
337	H-1001	Washer: flat, anokprene 6850 C-1, duro- meter 40/50, 15/16" I.D., x 1-5/32" O.D. x 1/16" thick	Washer, Antenna Cap				37	60178-23	H-1001	1	1	1	2	2	3	4
338	H-1002	Gasket: anokprene 6850 C-1, durometer 40/50, 1-7/8" O.D. x 1-3/8" I.D. x 1/16" thick, four holes 0.140" dia. equally spaced	Gasket, Antenna Mast Junction				37	888590-1	H-1002	1	1	1	2	2	3	4
339	H-1003	Gasket: anokprene 6850 C-1, durometer 40/50, 1-7/16" O.D. x 15/16" I.D. x 1/16" thick, six holes 0.140" dia. equally spaced	Gasket, Dipole Junction				37	888591-1	H-1003	1	1	1	2	2	3	4
340	H-1004	Nut: brass, 5/16" hex. x 1/4" long, tap tapped 1/4"-28 threads	Nut, Antenna Line Insulator Retaining				1	888706-1	H-1004	1					5	1
341	H-1005	Gasket: anokprene 6850 C-1, durometer 40/50, 1" square x 1/32" thick 5/8" dia. hole in center, 0.125" dia. hole each corner	Gasket, Mast Base Connector				1	888720-1	H-1005	1	1	1	2	2	3	4
342	H-1006	Screw ring: aluminum, 1.250" O.D. x 0.875" I.D. x 0.248" thick 1-1/4"-12 threads	Ring, Antenna Support Screw				1	888722-1	H-1006	1					5	1
343	H-1007	Not Used														
343	H-1008	Wrench: C.R.S. 3-15/32" long x 1/8" thick x 1-3/32" wide with 1/2" x 1/4" cutout one end, other end 1/8" dia. for 1/2"	Wrench, Dipole Spanner				1	880981-1	H-1008	1	2	1	1	1	1	2
344	J-1001	Jack assembly: consisting of polystyrene insulator 0.446" O.D. x 0.264" thick, 0.123" I.D. steel silver-plated plate 1" square x 0.075", with four 0.578" dia. mounting holes 23/32" on centers, and brass silver-plated fittings, with 35 pitch straight knurl and 5/8"-24 threads 5/8" O.D.	Jack, Antenna Input	RE 49F 188A			699	438110-505	J-1001	1	2	1	2	1	4	2
345	O-1001	Gear assembly: consisting of one aluminum die casting bracket, four ball bearings Fafnir Cat.#33-5, one stainless steel shaft 2-15/32" long, 0.1874" dia. with 5/16" dia. collar spaced 9/16" from one end, one stainless steel shaft 1-13/16" long 0.1874" dia., with 5/16" dia. collar spaced 1/2" from one end, one stainless steel gear, 36 teeth, 48 dia- metral pitch, 0.750" pitch dia., 63°26' pitch angle, 23°43' face angle, 0.768" O.D., one stainless steel gear, 18 teeth, 48 diametral pitch, 0.375 pitch dia., 26°34' pitch angle, 60°35' face dia.,	Gear, Antenna				1	439121-501	O-1001	1			2	1	1	1

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PARTS										SPARE PARTS						
ITEM	SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR. AND MFR'S DESIG.	CONTRACTOR'S DWG. AND PART NO.	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	QUAN.	BOX NO.	QUAN.
ANTENNA (Continued)																
	Q-1001 (Cont.)	angle 0.411" O.D., one stainless steel collar 7/16" O.D. x 1 1/4" thick, one steel universal joint 3/8" dia. x 1-1/8" long overall, one aluminum alloy gear, 36 teeth, 0.750" pitch dia., 0.7916" O.D., 48 diametral pitch, 14-1/2° pressure angle, with five steel taper pins and six steel setscrews, approx. 2-7/16" wide x 2-1/8" high x 3-15/16" long overall														
346	P-1001	Plug assembly: pin type, consisting of brass and silver-plated body pin adapter, sleeve splicer, and two nuts, including one neoprene insulator and two neoprene gaskets, overall dimensions 3/4" x 1 1/16" x 1.952" long	Plug, Transmission Line	RE 49P 188A			1364	438109-501	P-1001,1002	2	2	2	4	4	8	
	P-1002	Same as P-1001	Plug, Transmission Line						P-1002	1						
347	Z-1000	Antenna assembly: consisting of conductor assembly, two brackets fitted over tube assembly, connector assembly with screw ring, two rods, one 9.188" long, other 9.000" long, each 1/2" dia., with junction and insulator assembly, assembly "T" shaped, overall dimensions 19-7/8" long x 19.688" wide	Antenna, Dipole				1	618539-501	Z-1000	1		1	1	4	2	
348		Spare parts box	Spare Parts Box					618948-504							3	
349		Spare parts box	Spare Parts Box				1	618982-501				2				

CONTRACT NXsr - 60009

TABLE 8-3
PARTS LIST BY NAVY TYPE NUMBERS
MAR RADIO EQUIPMENT

QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED
MISCELLANEOUS (CLASS 10)								
1		A-101	1		E-603	14		H-118,715
1		A-102	1		E-604	2		H-119,716
1		A-103	1		E-605	3		H-120,717
1		A-104	1		F-606	1		H-121
4		A-702	1		E-608	1		H-122
1		A-1001	1		F-701	1		H-203
2	JAN SOS3	E-201,202	1		E-702	1		H-207
4	JAN SOS6	E-501,502,503,513	1		H-101	1		H-208
5		E-101A,203A,401A,403A,404A	2		H-102	1		H-209
1		F-106	1		H-103	2		H-210,510
1		E-204	1		H-104	1		H-306
3		E-205	6		H-105,201,408,409,410,602	1		H-307
3		F-206	12		H-106,202,411,412,413,603	4		H-401,402,403,404
1		E-208	1		H-107	2		H-405,406
2		E-301,1002	12		H-108,204,419,420,421,605	1		H-414
1		E-309	9		H-109,205,422,423,424,425,606,707,708	1		H-415
1		E-505	6		H-110,206,426,432,433,611	1		H-416
1		E-507	2		H-111,112	1		H-417
1		E-508	2		H-113,114	1		H-418
1		E-509	4		H-115,407,427,428	4		H-429,711,712,713
1		F-601	1		H-116	2		H-501,502
1		E-602	1		H-117	1		H-508

CONTRACT NXsr-60008

18-38370-V1

TABLE 8-3 (Continued)
PARTS LIST BY NAVY TYPE NUMBERS
MAR RADIO EQUIPMENT

QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED
MISCELLANEOUS (CLASS 10) (Continued)			MISCELLANEOUS (CLASS 10) (Continued)			MISCELLANEOUS (CLASS 10) (Continued)		
1		H-509	1		H-1004	1		O-503
1		H-511	1		H-1005	1		O-504
1		H-601	1		H-1006	1		O-508
1		H-604	1		H-1008	1		O-601
1		H-607	6		O-101	1		O-602
1		H-608	10		O-102, 103	1		O-603
1		H-609	2		O-104	1		O-604
1		H-610	4		O-105	1		O-606
1		H-701	1		O-106	1		O-607
1		H-702	4		O-107, 108, 109, 110	1		O-611
1		H-703	1		O-117	1		O-612
3		H-704, 705, 801	1		O-118	1		O-801
1		H-709	1		O-120	1		O-1001
3		H-710	2		O-121			
1		H-714	2		O-201	SPECIAL R-F DEVICES (CLASS 14)		
1		H-802	1		O-202	1		Z-100B
3		H-803, 804	1		O-203	1		Z-100C
1		H-805	1		O-204	MOTORS & GENERATORS (CLASS 21)		
1		H-901	1		O-205			
1		H-1001	1		O-206			
1		H-1002	1		O-501			
1		H-1003	1		O-502	1		B-602
						1	-211452A	B-601
						1	-211483	B-603

CONTRACT NXSP-60003

TABLE 8-3 (Continued)
PARTS LIST BY NAVY TYPE NUMBERS
MAR RADIO EQUIPMENT

QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED
ELECTRICAL MEASURING INSTRUMENTS (CLASS 22)			PROTECTIVE DEVICES (CLASS 28)			VACUUM TUBES (CLASS 38) (Continued)		
1	-22504	M-101	1		F-801	1	JAN 12A6	V-403
1		I-601				2	JAN 12H6	V-305, 401
SWITCHES (CLASS 24)			RELAYS (CLASS 29)			4	JAN 12SG7	V-301, 302, 303, 304
1	-24536	S-801	1	-29479	K-701	2	JAN 12SL7GT	V-402, 701
1	-24543	S-702	1		K-101	1	JAN 829B	V-101
1	-24544	S-703	2		K-102, 601	1	JAN 9003	V-201
1	-24568	S-401	1		K-702	THERMOSTATS & CRYSTALS (CLASS 40)		
1	-26026	S-701	TRANSFORMERS & REACTORS (CLASS 30)			1	-40148	F-514
3		S-101, 101A, 101B	1	-301844	T-703	1	-40177	Y-511
1		S-501	1	-301845	T-701	INDUCTANCES (CLASS 47)		
1		S-502	1	-301848	Z-401	8	-47810	L-301, 302, 303, 304, 305, 506, 507, 509
1		S-502A	1	-301849	T-702	1	-47867	L-104
1		S-502B	1		L-701	1	-47868	L-103
1		S-601	VACUUM TUBES (CLASS 38)			1	-47869	L-102
1		S-601A	2	JAN 2C39	V-102, 103	1	-47870	L-101
1		S-601B	2	JAN 6AG7Y	V-501, 504	2	-47871	L-802, 803
1		S-603	1	JAN 6AK5	V-202	1		L-106A
1		S-603A	3	JAN 6C4	V-502, 503, 505	1		L-109
1		S-704	1	JAN 6J6	V-203	1		L-113
			2	JAN 6L6GA	V-702, 703	2		L-114, 115

CONTRACT NXsr-60008

TABLE 8-3 (Continued)
PARTS LIST BY NAVY TYPE NUMBERS
MAR RADIO EQUIPMENT

QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED
INDUCTANCES (CLASS 47) (Continued)			CAPACITORS (CLASS 48) (Continued)			CAPACITORS (CLASS 48) (Continued)		
1		L-501	19	-48 2869-20	C-222, 225, 226, 244, 245, 246, 247, 349, 350, 351, 352, 353, 354, 510, 511, 525, 528, 529, 538	4	JAN CM40B-10 3K	C-40 4, 411, 415, 417
1		L-502				2		C-10 2, 10 4
1		L-504	1	JAN CC21BH-080D	C-513	2		C-117, 118
CAPACITORS (CLASS 48)			1	JAN CC21UJ-470K	C-327	5		C-20 2, 206, 210, 214, 218
4	-48 59 5A	C-407, 409, 410, 414	1	JAN CC30BH-390G	C-524	10		C-30 1, 30 2, 30 3, 30 4, 30 5, 30 6, 307, 308, 309, 310
1	-48 1176	C-408	1	JAN CC30TJ-910K	C-516	4		C-329, 337, 706, 7 26
7	-48 18 52	C-703, 711, 712, 801, 802, 803, 811	1	JAN CM20C-10 1J	C-537	2		C-40 2, 406
6	-48 280 4	C-715, 716, 717, 718, 733, 901	1			5		C-50 5, 50 5A, 50 5B, 50 5C, 50 5D
1	-48 280 9	C-103	4	JAN CM30A-15 2K	C-80 4, 806, 808, 813	1		C-506
1	-48 28 10	C-101	2	JAN CM30B-10 2J	C-731, 732	1		C-509
5	-48 28 11	C-205, 209, 213, 217, 221	1	JAN CM30B-10 2K	C-40 5	2		C-514
1	-48 28 12	C-201	1	JAN CM30B-15 2K	C-413	1		C-517
7	-48 28 13-10	C-204, 223, 227, 228, 229, 512, 530	1	JAN CM30B-18 2K	C-416	2		C-519, 522
33	-48 28 14	C-109, 110, 111, 121, 122, 123, 124, 125, 126, 127, 248, 312, 313, 317, 318, 321, 324, 331, 332, 333, 334, 335, 515, 518, 521, 523, 526, 527, 531, 534, 535, 536, 812	1	JAN CM35A-8 22K	C-80 5, 810	1		C-520
14	-48 28 15	C-311, 314, 315, 316, 319, 320, 322, 323, 325, 326, 330, 336, 338, 339	2	JAN CM35D-47 2K	C-70 2, 705, 708, 7 10, 7 30	2		C-532, 533
10	-48 28 16	C-224, 231, 232, 233, 234, 235, 236, 239, 240, 241	5	JAN CM35D-56 2K	C-70 1, 704, 707, 709, 7 21	1		C-807
1	-48 2867-20	C-328	5			JACKS, PLUGS & RECEPTACLES (CLASS 49)		
			1			1	AN 3106-20-4S 101W	P-903
			1			2	AN 3106-24-9S 101W	P-801, 904

CONTRACT NXST-60008

TABLE 8-3 (Continued)

QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED
JACKS, PLUGS & RECEPTACLES (CLASS 49)(Cont'd)								
1	AN UG-87/U	J-102	1	-53277	Z-402	2		E-104
10	-49 37 3	X-30 1, 30 2, 30 3, 30 4, 30 5, 40 1, 40 2, 40 3, 50 1, 50 4	1		Z-100A	2		E-105
1	-49 38 5	X-101	1		Z-101	1		E-107
1	-49 50 7	HS-70 1	1		Z-104	2		E-122
1	-49 53 4	W-70 2	3		Z-105, 80 3, 80 5	6		E-129
1	-49 56 1	W-70 3	1		Z-200	4		E-131
1	-49 58 4	X-50 7	1		Z-30 1	1		E-504
1	-49 62 3	X-50 6	1		Z-30 2	1		E-506
1	-49 88 3	L-10 7	1		Z-30 3	1		E-1001
1	-49 88 4	L-10 6	1		Z-30 4	1		E-1005
6	-49 95 6	X-20 1, 20 2, 20 3, 50 2, 50 3, 50 5	1		Z-30 5	1		E-1006
1		J-10 6	1		Z-500			
1		J-20 1	1		Z-50 1			
1		J-80 1	1		Z-50 2			
1		J-100 1	1		Z-70 1			
2		P-100 1, 100 2	1		Z-70 2			
			1		Z-70 4			
			2		Z-80 1, 80 2			
			1		Z-1000			
MICROPHONES (CLASS 51)								
1		MI-70 1						
FILTER UNITS (CLASS 53)								
1	-53276	Z-70 3	2		E-102, 103			
INSULATORS (CLASS 61)								
INSULATORS (CLASS 53) (Continued)								
1			1		Z-402	2		E-104
1			1		Z-100A	2		E-105
1			1		Z-101	1		E-107
1			1		Z-104	2		E-122
1			3		Z-105, 80 3, 80 5	6		E-129
1			1		Z-200	4		E-131
1			1		Z-30 1	1		E-504
1			1		Z-30 2	1		E-506
1			1		Z-30 3	1		E-1001
1			1		Z-30 4	1		E-1005
1			1		Z-30 5	1		E-1006
1			1		Z-500			
1			1		Z-50 1			
1			1		Z-50 2			
1			1		Z-70 1			
1			1		Z-70 2			
1			1		Z-70 4			
2			2		Z-80 1, 80 2			
			1		Z-1000			
WIRES & CONDUCTORS (CLASS 62)								
1			1		AN RG-58/U			W-201A
1			1		-62222			W-104
1			1		-62223			W-801
1			1		-62224			W-802
1			1		-62225			W-901
1			1					W-201

CONTRACT NXsr-60008

TABLE 8-3 (Continued)
PARTS LIST BY NAVY TYPE NUMBERS
MAR RADIO EQUIPMENT

QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	RESISTORS (CLASS 63) (Continued)	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED
2	-633031	R-701,725	4	JAN RC20- BF105K	R-317,318,406,407	4	JAN RC20- BF474K	R-403,404,416,512	RESISTORS (CLASS 63)		
1	-633032	R-104	1	JAN RC20- BF123K	R-418	2	JAN RC20- BF563K	R-301,420			
1	-633032-5	R-107	1	JAN RC20- BF151K	R-511	1	JAN RC20- BF681J	R-520			
3	-633033-5	R-412,415,422	3	JAN RC20- BF152K	R-204,320,405	1	JAN RC20- BF823K	R-414			
1	-633034-5	R-713	1	JAN RC20- BF154K	R-421	1	JAN RC21- BE821K	R-417			
1	-633036-5	R-103	1	JAN RC20- BF183J	R-519	1	JAN RC30- BF102J	R-514			
1	-633038-5	R-106	9	JAN RC20- BF222K	R-304,305,308,309,312,313, 315,316,408	2	JAN RC30- BF103K	R-209,213			
1	-633232-10	R-325	3	JAN RC20- BF223K	R-324,423,509	1	JAN RC30- BF103K	R-714			
1	-633233-10	R-432	6	JAN RC20- BF224K	R-201,205,206,322,409,705	1	JAN RC30- BF105J	R-707			
1	-633234-10	R-437	6	JAN RC20- BF271K	R-210,212,303,307,311,314	1	JAN RC30- BF123K	R-704			
1	-633236	R-720	1	JAN RC20- BF273K	R-419	1	JAN RC30- BF152J	R-507			
1	-633237	R-722	1	JAN RC20- BF332K	R-202	1	JAN RC30- BF153J	R-517			
1	JAN RC10- BF302J	R-433	1	JAN RC20- BF333K	R-207	1	JAN RC30- BF182K	R-523			
1	JAN RC20- BF102J	R-702	2	JAN RC20- BF334K	R-208,711	1	JAN RC30- BF272J	R-503			
1	JAN RC20- BF102K	R-211	1	JAN RC20- BF471K	R-321	2	JAN RC30- BF332J	R-510,518			
1	JAN RC20- BF103J	R-502									
1	JAN RC20- BF103K	R-323									
3	JAN RC20- BF104J	R-508,710,712									
6	JAN RC20- BF104K	R-302,306,310,401,402,413									

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TABLE 8-3 (Continued)
PARTS LIST BY NAVY TYPE NUMBERS
MAR RADIO EQUIPMENT

QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	QUAN- TITY	NAVY STOCK NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED
RESISTORS (CLASS 63) (Continued)			RESISTORS (CLASS 63) (Continued)			RESISTORS (CLASS 63) (Continued)		
1	JAN RC30- BF473J	R-513	1		R-319	1		R-319
1	JAN RC30- BF563K	R-203	1		R-424	1		R-424
1	JAN RC30- BF68LJ	R-504	1		R-425	1		R-425
1	JAN RC30 BF821J	R-501	1		R-434	1		R-434
2	JAN RC31- BF104J	R-706,709	1		R-601	1		R-601
1	JAN RC31- BF122K	R-802	1		R-715	1		R-715
2	JAN RC40- BF103K	R-521,522	1		R-716	1		R-716
1	JAN RC40- BF151J	R-116	1		R-717	1		R-717
1	JAN RC40- BF560K	R-115	1		R-719	1		R-719
1	JAN RC65- CE153K	R-411	1		R-721	1		R-721
1		R-101	1		R-724	1		R-724
1		R-102	1		R-726	1		R-726
1		R-105	1		R-801	1		R-801
1		R-108	1		R-803	1		R-803
3		R-109,426,427	1		R-804	1		R-804
1		R-110	1		R-805	1		R-805
1		R-112						

CONTRACT NXsr-60008

TABLE 8-4 APPLICABLE COLOR CODES & MISCELLANEOUS DATA

RESISTOR AND CAPACITOR CODES

MICA CAPACITOR CODING

Values of capacitance and tolerance are coded identically on both R.M.A. 6 dot and A.W.S. coded capacitors. Only the coding of the sixth (lower left) dot differs between the two.

R.M.A. CODE

P.M.A. coded capacitors have 3 or 6 dots located as shown below.

6 DOT COLOR CODE

EXAMPLE:

Orange	Orange
Black	Silver
Red	Red

033 + 00 = 3300 mfd capacitance
10% tolerance
"A" characteristic

A.W.S. CODE

A.W.S. coded capacitors may have a coded "Type Designation" or 6 colored dots as shown below.

TYPE DESIGNATION

CM 20 A 050 M

Component Case Characteristic Capacitance Tolerance

Identifies external shape and dimensions.

Identifies temperature coefficient and "Q".

CHARACTERISTIC: All mica capacitors are identified by "CM".

CAPACITANCE: The first 2 digits are the first 2 figures of the capacitance, in mfd. The third digit determines the number of zeros to add. If more than 3 digits are used, all except the last 3 digits are used, all except the last 3 digits are used, all except the last 3 digits are used.

TOLERANCE:

Designation	Tolerance
G	±2%
J	±5%
K	±10%
M	±20%

EXAMPLE: The above type designation identifies the capacitance as 50 mfd and the tolerance as 20 per cent.

8 DOT COLOR CODE

for mica capacitors of the shape shown below

EXAMPLE:

Orange	Orange	Orange	Orange
Black	Silver	Red	Red

033 + 00 = 3300 mfd capacitance
10% tolerance
"A" characteristic

R.C.A. CODE

for mica capacitors of the shape shown below

EXAMPLE:

Orange	Orange
Black	Silver

033 + 00 = 3300 mfd capacitance
10% tolerance
"A" characteristic

COLOR IDENTIFICATION

COLOR	DIGIT	ZERO ADD	TOLERANCE
BLACK	0	0	
BROWN	1	1	5%
RED	2	2	10%
ORANGE	3	3	20%
YELLOW	4	4	25%
GREEN	5	5	30%
BLUE	6	6	35%
VIOLET	7	7	40%
GRAY	8	8	45%
WHITE	9	9	50%

TEMP. COEFFICIENT

TEMP. COEFFICIENT	TEMP. COEFFICIENT
0	0
-0.30 x 10 ⁻⁴	-0.30 x 10 ⁻⁴
-0.60 x 10 ⁻⁴	-0.60 x 10 ⁻⁴
-1.5 x 10 ⁻⁴	-1.5 x 10 ⁻⁴
-2.2 x 10 ⁻⁴	-2.2 x 10 ⁻⁴
-3.3 x 10 ⁻⁴	-3.3 x 10 ⁻⁴
-4.7 x 10 ⁻⁴	-4.7 x 10 ⁻⁴
-7.5 x 10 ⁻⁴	-7.5 x 10 ⁻⁴

EXAMPLE:

The d-c working voltage of this type is 500 volts.

† Brown Dots
Red End Color

‡ 11 + 0 = 110 mfd capacitance
5% tolerance
-0.80 x 10⁻⁴ mfd/mfd/°C.
temperature coefficient
Inferred: 500 volt rating

COLOR IDENTIFICATION

COLOR	DIGIT	ZERO ADD	TOLERANCE
BLACK	0	0	
BROWN	1	1	5%
RED	2	2	10%
ORANGE	3	3	20%
YELLOW	4	4	25%
GREEN	5	5	30%
BLUE	6	6	35%
VIOLET	7	7	40%
GRAY	8	8	45%
WHITE	9	9	50%

TEMP. COEFFICIENT

TEMP. COEFFICIENT	TEMP. COEFFICIENT
0	0
-0.30 x 10 ⁻⁴	-0.30 x 10 ⁻⁴
-0.60 x 10 ⁻⁴	-0.60 x 10 ⁻⁴
-1.5 x 10 ⁻⁴	-1.5 x 10 ⁻⁴
-2.2 x 10 ⁻⁴	-2.2 x 10 ⁻⁴
-3.3 x 10 ⁻⁴	-3.3 x 10 ⁻⁴
-4.7 x 10 ⁻⁴	-4.7 x 10 ⁻⁴
-7.5 x 10 ⁻⁴	-7.5 x 10 ⁻⁴

EXAMPLE:

The d-c working voltage of this type is 500 volts.

† Brown Dots
Red End Color

‡ 11 + 0 = 110 mfd capacitance
5% tolerance
-0.80 x 10⁻⁴ mfd/mfd/°C.
temperature coefficient
Inferred: 500 volt rating

MICA CAPACITOR CODING

COLOR IDENTIFICATION

COLOR	DIGIT or ZERO ADD	TOLERANCE	R.C.A. mica	A.W.S.
BLACK	0		5%	
BROWN	1	1%		100 B
RED	2	2%		200 C
ORANGE	3	3%		300 D
YELLOW	4	4%	20%	400 E
GREEN	5	5%	25%	500 F
BLUE	6	6%	10%	600 G
VIOLET	7	7%		700 H
GRAY	8	8%		
WHITE	9	9%		900 I
GOLD	†	5%	5% (J)	1000
SILVER	†	10%	10% (K)	2000
NO COLOR		20%	20% (M)	500

† When the "ZERO ADD" color is GOLD, multiply the number obtained from "A" and "B" by 0.1 to get capacitance in mfd; when it is SILVER, multiply the number by 0.01.

RESISTOR CODING

(Composition and Low Power Wire Wound Resistors)

THE R.M.A. CODING AND A.W.S. CODING FOR THESE RESISTORS ARE IDENTICAL

FIRST SYSTEM

The body color indicates the type of resistor, and is coded as follows:

TYPE	COMPOSITION
Black	Any Color but Black
Chocolate	Insulated
Wire wound	Insulated

SECOND SYSTEM

The body color indicates the type of resistor, and is coded as follows:

TYPE	COMPOSITION
Black	Any Color but Black
Chocolate	Insulated
Wire wound	Insulated

COLOR IDENTIFICATION

COLOR	DIGIT or ZERO ADD	TOLERANCE
Black	0	
Brown	1	1%
Red	2	2%
Orange	3	3%
Yellow	4	4%
Green	5	5%
Blue	6	6%

† When the "ZERO ADD" color is GOLD, multiply the number obtained from "A" and "B" by 0.1 to get resistance in ohms; when it is SILVER, multiply the number by 0.01.

RESISTOR CODING

(Composition and Low Power Wire Wound Resistors)

THE R.M.A. CODING AND A.W.S. CODING FOR THESE RESISTORS ARE IDENTICAL

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Wire wound	Insulated

SECOND SYSTEM

The body color indicates the type of resistor, and is coded as follows:

TYPE	COMPOSITION
Black	Any Color but Black
Chocolate	Insulated
Wire wound	Insulated

TABLE 8-5
LIST OF MANUFACTURERS
MAR RADIO EQUIPMENT

CODE NUMBER	MFR. PREFIX	NAME	ADDRESS	CODE NUMBER	MFR. PREFIX	NAME	ADDRESS
1	CRV	Radio Corporation of America	Camden, N.J.	509	CRK	Radio Condenser Co.	Camden, N.J.
28	CAS	American Lava Corp.	Cherokee Blvd. and Manufacturers Road Chattanooga, Tenn.	516	CRC	Radio Corporation of America	Harrison, N.J.
30	CPH	American Phenolic Corp.	1830 S. 54th St. Cicero, Ill.	590	CSF	Soragne Specialties Co.	N. Adams, Mass.
47	CHH	Arrow-Hart and Hegeman Electric Co.	102 Hawthorne Street Hartford, Conn.	669	CW	Western Electric Co., Inc.	195 Broadway New York, N.Y.
86	CBH	Boston Gear Works Inc.	Terminal Commerce Bldg. Philadelphia, Pa.	670	CAY	Westinghouse Electric & Mfg. Co.	3001 Walnut Street Philadelphia, Pa.
113		Canfield Rubber Co.	Railroad Avenue and Gordon Street Bridgeport, Conn.	695		Santay Corp.	351 N. Crawford Ave. Chicago, Ill.
179		Boehler Die Casting Co.	Batavia, N.Y.	699	CUF	Ucinite Co. (Division of United Can Fastener)	1 Nevada Street Newtonville, Mass.
203	CMF	Electromotive Corp.	Willimantic, Conn.	710	CSL	Solar Mfg. Co.	588 Avenue A Bayonne, N.J.
207	CFR	Frie Resistor Corp.	644 W. 12th Street Frie, Pa.	713	CRY	C.P. Clare and Co.	Sunnyside and Keating Avenues Chicago, Ill.
218	CFT	Federal Telephone and Radio Corp.	320 Orange Street Newark, N.J.	714	CAW	Aerovox Wireless Corp.	742 Belleville Ave. New Bedford, Mass.
246	CG	General Electric Co.	Schenectady, N.Y.	721	QMR	Micamold Radio Corp.	1087 Flushing Avenue Brooklyn, N.Y.
277	CMC	Hammarlund Mfg. Co.	460 W. 34th Street New York, N.Y.	722	CBZ	Allen Bradley Co.	1326 S. 2nd Street Milwaukee, Wis.
308		Hunter Pressed Steel Co.	Lansdale, Pa.	727	CRN	Central Radio Lab. Central ab	900 E. Keefe Avenue Milwaukee, Wis.
321	CLR	International Resistance Corp.	401 N. Broad Street Philadelphia, Pa.	738	CCC	Continental Carbon Co.	295 Madison Ave. New York, N.Y.
334	CJC	Howard B. Jones Co.	2300 Wabansia Avenue Chicago, Ill.	752	CAO	Ward Leonard Electric Co.	6 South Street Mt. Vernon, N.Y.
439		New Denature Div. of General Motors	Bristol, Conn.	755	CEB	H.H. Eby Co.	4700 Stenton Avenue Philadelphia, Pa.
451	CCC	Oak Mfg. Co.	1200 N. Clybourne Avenue Chicago, Ill.	793	CO	Cornell-Dubilier Electric Corp.	1000 Hamilton Blvd. S. Plainfield, N.J.
508		Quaker City Gear Works	Front and Berks Streets Philadelphia, Pa.				

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18-38370-WAY21

TABLE 9-5 (Continued)
LIST OF MANUFACTURERS
MAR RADIO EQUIPMENT

CODE NUMBER	MPR. PREFIX	NAME	ADDRESS	CODE NUMBER	MPR. PREFIX	NAME	ADDRESS
795	CFQ	Speer Resistor Com.	Theresa Street St. Marys, Pa.				
863		Torrington Mfg. Co.	Torrington, Conn.				
887	CTN	Teleradio Engineering Com.	484 Broome Street New York, N.Y.				
935		Anaconda Wire and Cable Co.	808 Architects Bldg. Philadelphia, Pa.				
1045	CGG	Galvin Mfg. Com.	4545 W. Augusta Blvd. Chicago, Ill.				
1146		Metalcraft Products Co.	306 Cherry St. Philadelphia, Pa.				
1172	CIO	John Oster Mfg. Co.	Racine, Wis.				
1235	CPS	Sperling Products Co.	New York, N.Y.				
1358		Alliance Mfg. Co.	Alliance, Ohio				
1361		Billings and Spencer	Hartford, Conn.				
1371		Jeffers Electronics	Dubois, Pa.				
1381		L-R Manufacturing Co.	Torrington, Conn.				

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